REPORT RESUMES

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A SELECTIVE BIBLIOGRAPHY ON BRAIN-DAMAGED CHILDREN.

WOODS SCHOOL FOR EXCEPTIONAL CHILDREN

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DESCRIPTORS- *MINIMALLY BRAIN INJURED, *ANNOTATED BIBLIOGRAPHIES, ADOLESCENTS, BEHAVIOR, CEREBRAL PALSY, CHILDREN, CLINICAL DIAGNOSIS, DIAGNOSTIC TESTS, ETIOLOGY, NEUROLOGICALLY HANDICAPPED, SPECIAL EDUCATION,

THIS SELECTIVE BIBLIOGRAPHY INCLUDES 317 ANNOTATED REFERENCES DEALING DIRECTLY WITH THE BEHAVIORAL CHARCTERISTICS OF CHILDREN WITH CEREBRAL DYSFUNCTION. REFERENCES HAVE APPEARED IN JOURNALS OR OTHER SOURCES AVAILABLE IN UNIVERSITY LIBRARIES. THE BIBLIOGRAPHY IS CLASSIFIED INTO SIX MAJOR DIVISIONS--(1) THE ENTITY AND ITS DESCRIPTION, (2) CLINICAL AND SPECIAL DIAGNOSIS, (3) CHARACTERISTIC MECHANISMS AND NATURAL HISTORY, (4) ETIOLOGY (CLINICAL, EXPERIMENTAL, AND EPIDEMIOLOGICAL), (5) TREATMENT, EDUCATION, AND MANAGEMENT, AND (6) REVIEWS, OVERVIEWS, AND THEORIES. IN EACH DIVISION REFERENCES HAVE BEEN LISTED ALPHABETICALLY BY AUTHOR. THIS DOCUMENT IS AN EXCERPT FROM "BRAIN-DAMAGE IN CHILDREN--THE BIOLOGICAL AND SOCIAL ASPECTS" EDITED BY HERBERT G. BIRCH, REPRINTED WITH PERMISSION OF THE ASSOCIATION FOR AID OF CRIPPLED CHILDREN. (JA)

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A Selective Bibliography on BRAIN-DAMAGED CHILDREN

The Entity and Its Description

Clinical and Special Diagnosis

Characteristic Mechanisms and Natural History

Etiology—Clinical, Experimental, Epidemiologic

Treatment, Education, and Management

Reviews, Overviews, and Theories

An excerpt from
Brain Damage in Children—the Biological and Social Aspects
Edited by Herbert G. Birch, M.D., Ph.D.

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A Selective Bibliography on Brain-damaged Children

THE PREPARATION of a bibliography for a subject area has at least two purposes. The first is to facilitate the task of both the research worker and the practitioner by identifying the basic reports, materials, and conceptualizations that represent our present state of knowledge. The second is to provoke new inquiry by indicating regions of strength and weakness, of concern and neglect, and of agreement and disagreement. It is to be hoped that the following compilation and annotation of representative references can assist research both through the stimulation of exploration into relatively neglected aspects of the subject and through the more effective integration of ongoing investigation with the existing body of knowledge. Hopefully, too, it can be of more immediate practical usefulness by contributing directly to the effectiveness of clinical diagnosis and treatment as well as to educational practice and social planning.

The degree to which these objectives have been achieved by the present bibliography can be judged only by its users. But their judgment is likely to be more valid if they are aware of the selective and organizational criteria employed by the editors.

From the outset it was decided to be drastically selective and to limit the bibliography to materials dealing directly with children with cerebral dysfunction and, more particularly, with their behavioral characteristics. Despite the relevance of animal experimentation, of inquiries into the functioning of adult patients with central nervous system impairment, and of more general sociological and developmental study for the understanding of both the causes and consequences of cerebral dysfunction, references to such materials were systematically excluded if they did not bear directly on the problem.

The focus of the bibliography is therefore both sharp and narrow. It was made still sharper by the criterion that, to be maximally useful, references must be in the English language and must have appeared in journals or other sources readily available in university libraries.

Despite these successive restrictions, hundreds of references remained to be classified. Since many of them were either redundant or merely confirmatory, it was decided to limit the number of items still further by selecting for inclusion that report, among several, which was most representative and most informative.

The selection of a specific item does not, of course, imply that the editors have no quarrel with it and that its inclusion is equivalent to a reasoned critical endorsement of the methodology and viewpoint adopted by its authors. On the contrary, we disagree strongly with the findings and views expressed in a number of the papers included in the bibliography, but we feel justified in including them because they are representative of the kinds of problems which have been of interest to workers in this field and of the ways in which these problems have been approached. Within its limits, therefore, we hope that the bibliography reflects accurately the current state of our knowledge concerning children with cerebral dysfunction.

As is to be expected, an annotated bibliography for so rapidly expanding an area of research resembles the map of Africa in the days of Livingstone and Stanley. Well-explored regions are represented by an increasing wealth of detail but *terra incognita* either by blank spaces or by episodic recordings, the interrelations among which are obscure or absent. Although it fails to satisfy a desire for completeness or offends the esthetic sense by its lack of balance, such a map almost inevitably excites the creative imagination.

Like the task of selection, the task of annotation and abstracting of the items finally chosen was not without its difficulties. An abstract should capture the essence of a report. But what is this essence? A moment's reflection makes it clear that not only the interpretation of the report but, indeed, its very reading depends on who the reader is and what he looks for. The expert in an area may read with an eye toward what he considers crucial methodological nuances. The interested bystander searches for the conclusion which he can generalize. In terms of our map analogy, the expert on a locality might prefer a scale in yards—his distant neighbor, a scale in miles.

The abstracter must therefore make a judgment: How specific shall he be? Shall he report all the variables, such as age, sex, IQ, social class, personal characteristics, test used, or only the main ones? In this case a double standard was used. For the most part, all the variables reported were abstracted. However, in a number of instances this standard was not followed literally either because the variables were not reported completely (this happened most often in the realm of social variables) or because the report was flooded with overly specific details. The effort was made to follow the spirit of the author's intent—an admittedly subjective criterion.

In reporting results, a similar problem arose: How specific and technical a language should be used to record the findings? A compromise between technical specificity and general intelligibility was sought. For some papers technical accuracy seemed crucial; for others, intelligibility seemed more important.

In assessing a large number of references, the bibliographer is likely to develop a certain sense of irritation and dissatisfaction. In part, this reaction is personal and best repressed, but these negative feelings stem also in part from certain persistent deficiencies in the reported work. Since such deficiencies affect the evaluation of the work being reported, they ought to be noted.

One such deficiency derives from the vagueness of the clinical entity with which we are concerned. In different studies children described as "brain-damaged," "with organic [*sic*] brain damage," "organic," "exogenously retarded," "with cerebral dysfunction," etc. have ranged from individuals of relatively normal intelligence and behavior but some dyskinesia to severely defective individuals with psychotic behavior and marked motor impairment. The specific samples of children studied are often inadequately described, and the degree of comparability between reports presumably concerned with the variety of patients is undeterminable. Behavioral measures, too, have varied widely, and different studies, presumably of the same psychological functions, have utilized techniques so different as to measure independent functional entities. Thus, of two studies concerned with perception, one uses drawing tasks (from which indices of perception are inferred) and the other a tachistoscopic identification of visual design. Resulting differences in findings are then irrationally argued as representing contradictions.

At another level, important and oft-repeated methodological deficiencies occur. Excellent clinical description is accompanied by crude and erroneous statistics or by none at all, and by unnecessarily inelegant physiologic, genetic, or psychologic examination. In contrast, highly sophisticated psychologic, epidemiologic, and genetic explorations are defective in neurologic or pediatric skill or sophistication. Viewed against the bibliography as a whole, these difficulties appear to be of major proportions and constitute a most cogent argument for the pooling of research skills and for interdisciplinary training. Its deficiencies notwithstanding, however, we believe that the bibliography is useful and that it reflects accurately the state of published knowledge concerning cerebral dysfunction in children.

In order to facilitate use, references have been classified into six major divisions as follows:

1. The entity and its description.
2. Clinical and special diagnosis.
3. Characteristic mechanisms and natural history.
4. Etiology—clinical, experimental, epidemiologic.
5. Treatment, education, and management.
6. Reviews, overviews, and theories.

Within each section references have been arranged alphabetically.

1. THE ENTITY AND ITS DESCRIPTION

Baxter, D. W., and Bailey, A. A.: Primary reading epilepsy, *Neurology, 11*:445–449, 1961. Two cases of primary reading epilepsy are reported (CA 19, CA 15). Patients with primary reading epilepsy complain of a sensation of jaw-snapping or jaw-opening when reading. Such symptoms are most likely to develop when the patient reads aloud or when the reading material requires concentration. A generalized seizure is likely to occur if he persists in reading once the myoclonic jaw movements occur. These patients do not have seizures in any other circumstances, and their neurologic examinations are normal.

Bender, L.: "Post-Encephalitic Behavior Disorders in Childhood," in *Encephalitis: A Clinical Study*, ed. J. Neal. Grune & Stratton, 1942. After reviewing follow-up studies reported in the literature, Bender recounts her experiences with 55 children studied between 1934 and 1940 (all born after 1919). These children constituted .14 percent of admissions to the Bellevue Hospital service, indicating the rarity of this disorder. The primary manifestations are psychopathic personality type of reaction with hyperkinesis not modifiable by insight or psychotherapy, typical psychometric patterns and motility disturbances. A number of cases are presented to illustrate that motility and impulse disturbances progress, whereas disturbance in perceptual patterns does not.

Bender, L.: Psychological problems of children with organic brain disease, *Amer. J. Orthopsychiat., 19*:404–441, 1949. Psychological problems arise in the organically "sick" child because (1) motor disorders make for prolonged dependency on the mother; (2) perceptual or intellectual problems lead to frustrations, misinterpretations of reality, and bizarre behavior patterns in efforts to make contact with the world; and (3) disturbed patterning of impulses leads to distortion in action patterns with compulsive features. Anxiety due to physiologic disorganization but secondary to frustration is basic. The method of treatment is prolonged mothering, avoidance of isolation, and specific aids for motor, perceptual, and interpersonal disabilities. Strong drive to normality is present.

Bender, L.: *Psychopathology of Children with Organic Brain Disorders.* Charles C. Thomas, 1959. In this series of essays summarizing the work at Bellevue Hospital, Bender is concerned with the ways in which organic children adapt to their damage. Following an examination of the psychological implications of motor development, which is concerned with the function of mobility in maintaining posture and with actions to achieve security and explore the world, considerations of the psychology of organic disturbances of the cerebellum are presented to show the close relationship between physiological and psychological development. Sections on the psychiatric implications of organic brain disorders, personality problems of the child with a closed head injury, body-image problems of the brain-damaged child, and a summary round out the book. The influence of Schilder (*Ment. Hyg., 15*:480–486, 1931; *19*:539–446, 1935; Proceedings of Fourth Institute on Exceptional Children, Wood School, *4*:38–59, 1938) is fully acknowledged. Much of Bender's previous work (*Amer. J. Orthopsychiat., 10*:287–292, 1940; *17*:68–79, 1947; *22*:335–355, 1952; *Ment. Hyg., 24*:617–630, 1942; *Arch. Pediat., 59*:772–783, 1942; *Confin. Neurol., 3*:320–331, 1941) constitutes the basis of the book. Total evaluation of developmental levels and the special needs, particularly severe anxiety, are stressed. Treatment involves support, planned program for patterning impulses, drugs, and psychotherapy.

Blau, A.: Mental changes following head trauma in children, *Arch. Neurol. Psychiat., 35*:723–769, 1937. Twenty-two children who showed mental changes following head trauma are reported. The cases are classified into post-traumatic acute psychosis, post-traumatic chronic behavior disorder, post-traumatic epilepsy with secondary deterioration, and secondary intellectual deterioration. The symptomatology of the organic behavior disorder in children is discussed, and it is suggested that the disorder may be the result of a localized lesion of the prefrontal association areas. The varieties of mental changes in children are reviewed from a historical standpoint.

Bradley, C.: "Organic Factors in the Psychopathology of Childhood," in *Psychopathology of Childhood*, eds. P. Hoch and J. Zubin. Grune & Stratton, 1955. After outlining some of the reasons for the neglect of organic factors by psychiatry, Bradley states that hyperactivity and deviant psychological test performances are the most general response to brain injury in children. Some neurophysiological theories are offered: Jasper on abnormal discharges, Strauss on deficiency of inhibition of higher cortical centers, Kahn and Cohen on brain-stem lesions, Blau on frontal lobes. A description of the secondary symptoms, including perseveration, etc., is offered. Considerations in the use of the neurologic examination, the EEG, and treatment procedure round out the chapter.

Cohn, R.: Delayed acquisition of reading and writing abilities in children: a neurological study, *Arch. Neurol.*, *4*:153–164, 1961. Forty-six children, aged 7 to 10, were selected from a county school system because of specific reading and writing difficulties. Profiles of language development, somatic receiving and expressive systems, personal spatial organization, and social adaptation were recorded. Two control groups of 100 normal children and 24 children with reading problems who were able to function in a normal school setting were used. Tests showed the experimental group to be inferior in language as well as in most of the other areas. More than 50 percent showed EEG abnormalities in comparison with 10 percent of the controls. Defects persisted two years later when 29 were re-examined. Maturational lag was also noted when behavior functions were plotted longitudinally. Hyperactivity is a consequence of disorganization of motor patterns rather than a reaction to social rejection. Delay in grasping graphic language symbols therefore reflects a general disturbance in biological function.

Doll, E. A.: Neurophrenia, *Amer. J. Psychiat.*, *108*:50–53, 1951. Neurophrenia denotes abnormal behavior resulting from central nervous system impairment. The term was introduced because of a number of objections to the term "cerebral palsy," which refers only to neuromuscular consequence of cerebral impairment, refers to only one point of anatomy, and does not specify the time of onset or etiology. A description of the symptomatology at this stage must be impressionistic. There are disturbances in neuromuscular coordination, receptivity, behavior patterns, and emotions. Because of variability in behavior, its interpretation on standard instruments is hazardous.

Green, J. B.: Association of behavior disorder with an electroencephalographic focus in children without seizure, *Neurology*, *11*:337–344, 1961. Behavior disorders associated with abnormal electroencephalograms in 10 children divided into three groups are reported. The first group ($N = 5$) were characterized by hyperactivity, short attention span, and probable intellectual deficit. The second group ($N = 3$) were children of normal intelligence with varied behavior problems. The third group ($N = 2$) had paroxysmal headaches. A spike focus in a temporal or occipital area was identified in all but one case. None of the children had a history of seizures at the time of initial study. Most were referred by a school psychologist after testing "suggested an organic mental disorder." The children were strikingly similar in behavioral characteristics to children with psychomotor seizures. Anticonvulsant medication was prescribed in each case but was of little help in the first group, some help in the second, and very helpful in the third.

Hanvik, L. J., Nelson, S. E., Hanson, H. B., Anderson, A. S., Dressler, W. H., and Zarling, V. R.: Diagnosis of cerebral dysfunction in children as made in a child guidance clinic, *Amer. J. Dis. Child.*, *101*:364–375, 1961. Independent ratings of brain damage were made on 150 children (CA 7–14) by two electroencephalographers, a psychologist, and a pediatrician. Each used his own methods without knowledge of the findings of the others. A psychiatrist made an over-all judgment based on all the available data. The diagnosis of brain damage apparently varies with the diagnostic tool. Although there appears to be an underlying agreement between the EEG and the psychologist's rating ($r = .40$) and between the medical examination and the psychological examination ($r = .35$), the relationship is not strong enough to permit reliance on a single tool. The final diagnosis of brain damage was made in 59 percent of the cases. Different rates of diagnosis of brain damage characterize the three disciplines.

Ingram, T. T. S.: A characteristic form of overactive behavior in brain damaged children, *J. Ment. Sci.*, *102*:550–558, 1956. Histories and clinical findings of 25 children showing overactive behavior are presented. Distractibility, short attention span, urge to chew and touch objects, lack of affective relationships, aggression, absence of fear, and failure to respond to punishment are characteristic. Neurological findings indicate the presence of cortical damage in most cases (*e.g.*, 18 were hemiplegic and 13 had epilepsy). Phenobarbitone increased behavior symptoms but decreased epilepsy. Amphetamine and primidone controlled behavior symptoms. All had histories suggesting brain damage: 13 at birth (anoxia) and 12 due to trauma, 10 of these 12 having been less than three years old at the time of illness. Histories and neurological findings implicate temporal lobes in most cases.

Jacob, W.: Helping teachers recognize some mentally retarded types, *Train. Sch. Bull.*, *48*:160–165, 1951. The brain-damaged child who is retarded by noninherited causes and who shows recognizable symptoms is discussed. Pathologically, psychologically, and intellectually, the symptoms and abilities of these children reveal either no obvious defects or wide swings of ability. Mental age is inadequate as a basis for judging these children, and the IQ is discouraged as a measure. Usual concepts of teaching the mentally retarded do not fit needs of the brain damaged. Experimentation with various teaching methods is urged.

Knobel, M., Wolman, B., and Mason, E.: Hyperkinesis and organicity in children, *Arch. Gen. Psychiat.*, *1*:310–321, 1959. On the basis of a "syndromic approach" to the acting-out child, careful measurements from a variety of sources, including history of pregnancy, birth and early development, EEG's, psychological tests, neurological examinations, and psychiatric interviews, were obtained from 40 children referred to a child guidance center. Hyperkinesis and hypokinesis were defined by a symptom check list. The determination of organicity was made by combining neurological, psychological, and EEG tests. Hyperkinesis was not related to organicity. The findings are considered in terms of newer developments in neurophysiology. Ritalin appears useful. A previous report appeared in *Dis. Nerv. Syst.*, *20*:80–85, 1959.

Laufer, M. W., and Denhoff, E.: Hyperkinetic behavior syndrome in children, *J. Pediat.*, *50*:463–474, 1957. A specific and common behavior disorder in children, the hyperkinetic syndrome is characterized by hyperactivity, short attention span, impulsiveness and distractibility, explosiveness, variability, and poor school work. A laboratory procedure—the photo-Metrazol EEG—offers a means of explaining the mechanism and confirming the existence of this syndrome. The syndrome responds to amphetamine and requires psychological guidance for the parents. It may require psychotherapy for the child. It tends to disappear by adulthood.

Lenneberg, E. H.: Understanding language without the ability to speak, *J. Abnorm. Soc. Psychol.*, *65*:419–425, 1962. Present theories of language acquisition assert that babbling, hearing oneself vocalize, and imitation are the cornerstones of speech development. These involve the motor skills necessary for speech. The case presented here, which is typical of a large category of patients, is one in which an organic defect prevented the acquisition of the motor skill necessary for speaking a language (anarthria), but in which there was evidence of the acquisition of grammatical skills. This case, considered together with language deficit in certain mongoloids, clearly shows that babbling, hearing oneself talk, and imitation are neither sufficient nor necessary factors in the acquisition of grammar. Present theories are, therefore, inadequate.

Morris, D. P., and Dolier, E.: Childhood behavior disorders: subtler organic factors, *Texas State J. Med.*, *57*:134–138, 1961. On the basis of 12 cases, clinical histories, diagnostic techniques, and a therapeutic program are outlined for the minimal and relatively unrecognized dysfunctions of the nervous system which may cause behavior deviations. These deviations occur at all levels of intelligence. Their understanding by all concerned is difficult because these handicaps are not obvious. It is helpful to interpret the nature of the handicap to the child himself.

Paine, R. S.: Minimal chronic brain syndromes in children, *Develop. Med. Child Neurol.*, *4*:21–27, 1962. In response to a recent debate over the concept of "syndrome of brain damage" in children, 41 children (CA 4–12) seen in a private neurologic practice because of poor school work, overactivity, clumsiness, poor speech, or emotional problems are presented. Of these, 31 showed abnormal neurological signs, whereas 9 of the remaining 10 were excessively clumsy. It is suggested that there is a syndrome of minimal brain damage, with subclinical manifestations in each of the four areas—motor, mental, sensory, and convulsive.

Strecker, E. A., and Ebaugh, F. G.: Neuropsychiatric sequelae of cerebral trauma in children, *Arch. Neurol. Psychiat.*, *12*:443–453, 1924. During a one-year period, 30 children (CA 3–16) with histories of head injury were referred. Immediately after onset, major problems were cerebral concussion, headache, and vertigo. Neurologic disturbances occurred in very few of the cases. The post-traumatic behaviors were characterized by "traumatic constitution" —*i.e.*, explosive outbreaks ($N = 15$)—and "traumatic defects"—*i.e.*, amnesias, mental deterioration, etc. ($N = 15$) Psychologic findings indicated fatiguability, *e.g.*, poor digit span. These disorders resemble post-encephalitic disorders of children, not the adult traumatic sequelae. They are related to delinquency. Prognosis: 6 are improving, the rest are not. Treatment: surgery in acute stage. Drugs are useless. Environmental manipulation helps.

Walker, E. F., and Katz, D. L.: Brain-damaged children: the problem of relations in the family group, *Calif. Med.*, *88*:320–323, 1958. From a larger sample of brain-damaged children, 16 who had minimal brain damage and responded to drugs are presented for detailed study. Although no motor abnormality was present, diagnosis could be made from the history, EEG, psychological tests, and repeated observations. Behavior is a composite of the brain damage and of the child's response to his environment, which continually thwarts him. Only one set of parents showed accepting attitudes. Two weeks after the children had been placed on a drug regime which helped them, improvement in attitudes was noted in 11 of the 16 sets of parents. The parents were able to shift their concern from their own problems to those of the child.

Weir, H. F., and Anderson, R. L.: Organic and organizational aspects of school adjustment problems, *J.A.M.A.*, *166*:1708–1710, 1958. Of 181 school children with severe school adjustment problems, electroencephalographic and neurological evidence of brain damage was found in a large percentage of cases (75% abnormal EEG). The use of tranquilizing drugs was helpful in reducing tension. The significance of the problem is seen by the fact that 5 percent of the children in the school system (Rockford, Ill.) fail in any given year. The physician is urged to become interested in this area.

Woods, G. E.: The early diagnosis of cerebral palsy, *Cereb. Palsy Rev.*, *22*:10–14, 1961. This is an account of the clinical signs of cerebral palsy manifested in the young infant. The paper is discussed by J. P. Duarte, J. Hariga, and B. Epstein.

2. CLINICAL AND SPECIAL DIAGNOSIS

Allen, R. M., and Collins, M. G.: Suggestions for the adaptive administration of intelligence tests for those with cerebral palsy, *Cereb. Palsy Rev.*, *16*:11–14, 1955. Three types of tests may be used to obviate the handicaps in cerebral palsy. Type I, which is discussed most extensively, includes techniques that assume an understanding of verbal directions but do not absolutely require motor manipulation. Type II involves developmental assessment rather than formal testing. Type III tests call for a constant shift in the nature of the instructions. The Ammons, Columbia Mental Maturity Scale, Progressive Matrices, and Leiter International Performance Scale are examples of Type I tests. Where motor involvement prevents the patient from performing, the examiner may point to alternative items one at a time. Detailed considerations in the practical uses of these instruments with cerebral-palsied persons are cited. The report is of interest to those concerned with technical problems of psychological evaluation.

Allen, R. M., and Jefferson, T. W.: *Psychological Evaluation of the Cerebral Palsied Person.* Charles C. Thomas, 1962. This brief manual includes testing procedures and suggestions for their use with individuals with cerebral palsy. Various tests that do not penalize the individual for his handicap are described, as well as procedures for gathering behavioral information (Gesell scales and Vineland Social Maturity Scale). Issues and procedures in personality and vocational assessment are discussed. The literature pertinent to the application of specific techniques to cerebral-palsied individuals is surveyed. Tips on "how to" test are presented throughout.

Arthur, B.: Comparison of the psychological test performance of brain damaged and normal children in the mental age range from five to six, University of Michigan, *Diss. Abst., 19*:6, 1958. Thirty children, aged 5 to 6, with a history of brain damage and positive evidence of central nervous system damage were compared on the Stanford-Binet with 30 controls. All the intelligence, perception, and motor tests discriminated between the two groups. Results indicate that there is a separation of intelligence and perception at an early age. Patterns of success and failure on intelligence tests can be used to diagnose the presence of brain damage. (Original not seen.)

Avakian, S. A.: The applicability of the Hunt-Minnesota Test for organic brain damage to children between the ages of ten and sixteen, *J. Clin. Psychol., 17*:45–49, 1961. Eighteen boys with a history of head injury, encephalitis, or convulsions, attending an institution for delinquent boys, were compared with a control group matched for age, grade, and IQ, attending a parochial or public high school. The control group exceeded the brain-injured groups ($p = .01$) on the Hunt-Minnesota Test. Using a cut-off point of 60, it was possible to classify correctly all the brain-injured but one and all the controls but one. The Hunt-Minnesota is therefore recommended for children from 10 to 16 years of age.

Ayres, A. J., *The Ayres Space Test*, Western Psychological Services, 1962. This manual presents a rationale and norms for testing space perception, particularly in disabled persons, including the cerebral palsied. The test has been standardized within a factor analytic framework derived from Guilford's work. It may prove useful in studying brain-injured children.

Beck, H. S., and Lam, A. L.: Use of the WISC in predicting organicity, *J. Clin. Psychol., 11*:154–158, 1955. Three groups of children—a "definitely organic" group ($N = 27$, CA 10), a "suspected organic" group ($N = 48$, CA 10), and two nonorganic groups ($N = 40$, CA 11) received the Wechsler Intelligence Scale for Children with the following results: (1) organics tend to score lower on the full-scale WISC than nonorganics (58 vs. 74; $p = .01$); (2) organics do less well on the performance than on the verbal scale whereas nonorganics do not; (3) the possibility of organicity increases as the IQ drops; (4) there is no typical organic pattern on the WISC; (5) 31 of 42 children with IQ's below 80 who, as a result of tests, were suspected of organic disease were found to have confirmatory neurological signs. All the children had been referred for eligibility for special classes in a southern Illinois public school system.

Bender, L.: *A Visual Motor Gestalt Test and Its Clinical Use*, American Orthopsychiatric Association, 1938. This classic monograph has gone through nine printings. Gestalt psychology, with its emphasis on perception and the total situation, supplies a theory for a specific test involving the copy of forms which permits observation of a wide range of phenomena and clinical populations. Particular concern with processes of maturation in the growing child, the primitive, and the retarded child is emphasized along with the interplay between vision and movement. The second half of the monograph is concerned with the clinical application of the test in studying aphasia, brain damage, schizophrenia, manic depressive psychosis, mental deficiency, malingering, and psychoneurosis. Both the theory and technique have made important contributions.

Bender, L.: Goodenough test in chronic encephalitis in children, *J. Nerv. Ment. Dis., 91*:277–286, 1940. The theory that drawings of a human figure are related not only to intellectual development but to the maturation of the body image is presented. Children who have been known to be suffering from chronic encephalitis draw below the level expected from an intelligence test. Six cases are used to illustrate this. "However, the test is not always reliable in the nonspecific types of encephalitis or traumatic conditions of the brain, due probably to localization problems." The test is "a reflection of a specific disability. . . ." It illustrates the "importance of mobility in the perception of one's own body. . . ."

Berko, M. J.: Mental evaluation of the aphasic child, *Amer. J. Occup. Ther., 5*: 241–246, 1951. The concept of IQ for this type of child is useless for all but statistical purposes. Examples of how testing is altered to fit a number of difficulties in this type of child are recorded. They include ways of dealing with propositional difficulties, disorders in categorical behavior and abstract ability, apraxia and agnosia, and initiatory delay and confusion. These difficulties often simulate mental retardation and can be distinguished from retardation by (1) the presence of absurd responses not in keeping with the intelligence level, (2) "digging out" the logic behind the absurdity, and (3) motor performance on Strauss-type tests.

Berko, M. J.: Measurement of behavioral development in cerebral palsy, *Cereb. Palsy Rev., 15*:5–6, 1953. Fifty cerebral-palsied children undergoing habilitative training at the Institute of Logopedics received the Vineland Social Maturity Scale and the Gesell Developmental Schedules at the onset and close of a 23-week training period. The subjects (CA 16 months to 27 years) were classified on a four-point scale on the basis of grossness of defect. The findings show that social maturity was roughly 60 percent below normal. The Vineland appears to be highly related to the degree of physical handicap. 38 of the subjects gained in social quotients following habilitation. The group as a whole gained .68 of a year as opposed to an elapsed period of .44 of a year. The amount of gain is highly correlated with the original social quotient ($r = .94$). The Gesell was broken down into separate areas. Results paralleled the Vineland.

Berko, M. J.: Some factors in the mental evaluation of cerebral palsied children, *Cereb. Palsy Rev., 14*:6–7, 1953. The consequences of the motor and sensory problems for socialization are illustrated. Inadequate socialization may penalize the cerebral-palsied child as much as his actual handicap. Emotional habit distortions similar to those of the aphasic child should be recognized. Perceptual deviations also occur. The following test modifications are therefore suggested: (1) evaluate the highest level of performance, (2) evaluate specific areas of ability and disability, and (3) evaluate in quantitative terms. The value of these suggestions is seen by the fact that test-retest of 50 cerebral-palsied children following one year of treatment at the Institute of Logopedics showed an average IQ gain of four points. This is presumed to be due not to an actual rise in intelligence but to increased ability to perform specific tasks.

Berko, M. J.: Some factors in the perceptual deviation of cerebral palsied children, *Cereb. Palsy Rev., 15*:3–4, 1954. Repeated failure on the Seguin Formboard task has been noted in examination of more than 300 cerebral-palsied children. In a comparison of 20 cerebral-palsied children with matched controls (CA 9, MA 7–8), 19 of the 20 cerebral palsied made 90 errors on the first trial of the Seguin, whereas 4 of the controls made 8 errors. In copying a diamond, only 2 of the cerebral-palsied group and 18 of the controls were able to copy it successfully on the first trial. The errors appear to resemble those found in younger normal children—*e.g.*, deviation in perception of the diagonal. Inadequate experience with perceptual phenomena account for this lag. Methods of remedying it are suggested.

Berko, M. J.: The measurement of intelligence in children with cerebral palsy: the Columbia Mental Maturity Scale, *J. Pediat., 47*:253–260, 1955. After a discussion of some of the psychological problems of the brain-injured child and the difficulties they pose in psychometric evaluation, a detailed account of the Columbia Mental Maturity Scale is presented. Although designed for use with brain-injured children, the CMMS has many problems. In a sample of 30 cerebral-palsied children (CA 7; IQ 68; MA 6), only 9 achieved a CMMS score within +4 to −4 points of the Stanford-Binet, whereas 21 did not. Those who showed a greater discrepancy had more signs pathognomonic of brain injury—*e.g.*, confusion, overconcreteness, etc. CMMS, therefore, must be interpreted cautiously.

Berko, M. J.: A note on psychometric scatter "as a factor in the differentiation" of exogenous and endogenous mental deficiency, *Cereb. Palsy Rev., 16*:20, 1955.

Forty-six retarded children (CA 9.3; MA 4.5; IQ 48) classified as "aphasic" by both a speech examiner and a psychologist were compared with matched nonaphasic controls. On the basis of the number of errors between the last consecutive item passed and the upper limit of each child's total performance, the aphasics showed an average of 12.54 misses and the controls 6.78 misses ($p = .006$). Berko concludes that psychometric scatter can therefore differentiate the brain-injured from the non-brain-injured retardate.

Blau, T. H., and Schaffer, R. E.: The Spiral Aftereffect Test (SAET) as a predictor of normal and abnormal electroencephalographic records in children, *J. Consult. Psychol., 24*:35–42, 1960. The SAET was administered to 46 children (CA 10–12, Gr. 4) who showed abnormal EEG's and a matched group of 20 children who showed no abnormal signs. Ratings of EEG abnormality were made by a single judge, who rerated the records reliably ($r = .77$). In addition, the Bender Gestalt, Draw-A-Person, and the Wechsler Intelligence Scale for Children were administered. All measures distinguished the groups. The SAET predicted the normal EEG 100 percent of the time and the abnormal EEG 86 percent of the time. It is more accurate than any other measure. The SAET appears to be a useful measure of cortical dysfunction. Limitations of EEG data are discussed.

Blum, L. H., Burgemeister, B., and Lorge, I.: Trends in estimating the mental maturity of the pre-school child, *Except. Child., 17*:174–177, 1951. This brief report on the testing of the motor-handicapped child describes the development of the Columbia Mental Maturity Scale.

Burgemeister, B., Blum, L. H., and Lorge, I.: Columbia Mental Maturity Scales: Ages Three to Twelve. Kit of 100 test cards, with manual; untimed (15–30 minutes). World Book Co., 1952. This test was standardized on 957 normal children, ages 3 to 12, who also took the Stanford-Binet (Form L). It is designed to test the intelligence of motor- and/or speech-impaired children. Stimuli are generally within the range of experience of handicapped children. No verbal response is necessary, and the test score is convertible to mental age and IQ scores. The task consists, essentially, in selecting a stimulus different from others that are alike.

Canter, A.: The use of the Columbia Mental Maturity Scale with cerebral palsied children, *Amer. J. Ment. Defic., 60*:843–851, 1956. Of 30 children (CA 5–17) attending a cerebral palsy center, 4 could not comprehend test instructions. Data on 24 indicate that 50 percent are retarded on the basis of the CMMS. The CMMS ranked children on intelligence about as well as other tests; however, IQ attainment was influenced by perseveration and the speech handicap. Because the CMMS may also be related to severity of disability, and because it relies very heavily on visuo-perceptual functions, its usefulness may be limited. Eight revisions are suggested to make it clinically useful.

Chorost, S. B., Spivack, A., and Levine, M.: Bender Gestalt rotations and EEG abnormalities in children, *J. Consult. Psychol., 23*:559, 1959. This is a brief report on 68 adolescents at Devereux Schools. Of these, 51 had rotations on the Bender Gestalt; 17 did not. Of those who showed rotations, 69 percent had abnormal EEG's; of those who did not, 47 percent had abnormal EEG's. Although the difference is significant ($p = .05$), it does not support Hanvik's conclusion that Bender rotations are diagnostic of brain injury. Diagnostic efficiency and scientific validity are not equivalent.

Clawson, A.: *The Bender Visual Motor Gestalt Test for Children*, Western Psychological Services, 1962. This manual on the use of the BVMGT for children describes the administration of the test, the development of visual motor function in the normal child, and the significance of BVMGT factors with normal and disturbed children. A chapter on the BVMGT and cerebral disorders, along with a case record, is included.

Costello, G. C.: Aphasic cerebral palsied children's wrong answers on Raven's Progressive Matrices, *J. Clin. Psychol., 15*:76–79, 1953. Ten cerebral-palsied children were matched with 10 children who had had poliomyelitis on age (9 years) and Matrices Scores. Data show differences in frequencies in the selection of a particular type of wrong answer. The cerebral-palsied children are more evasive.

Crowell, D. H., and Crowell, D. C.: Intelligence test reliability for cerebral palsied children, *J. Consult. Psychol.*, *18*:276, 1954. Test-retests on 61 cases with two to six examinations per child were obtained at an average interval of 30 months. Half the group scored within five points on test-retest and 75 percent scored within ten points. Test-retest correlation was +.92 with a standard error of ±11. The tests may therefore be considered highly stable for clinical purposes.

Cruickshank, W. M., Bice, H. V., and Wallen, N. E.: *Perception and Cerebral Palsy*. Syracuse University Press, 1957. To test the proposition that perceptual functioning is disrupted in brain-injured children, spastic (211) and athetoid (114) cerebral-palsied children (CA 6–16, IQ above 75, able to use at least one hand, intelligible speech, and minimum MA 6) were matched with 110 controls and tested on the following tasks: tactual motor test, marble-board test, Syracuse Visual Figure-Background Test, two-disc tests, and a maze. In general (1) the nonhandicapped group performed more adequately than both cerebral-palsied groups, and (2) the tests did not correlate highly with each other, arguing against the notion of a generalized perceptual impairment. Some of the limitations are discussed. The study presents in detail many of the technical problems in scoring tests.

D'Asaro, M. J., and John, V.: Rating scale for evaluation of receptive, expressive and phonetic language development in the young child, *Cereb. Palsy Rev.*, *22*:3–5, 1961. Items were drawn from the Gesell Inventory, the Cattell, and the Stanford-Binet pertaining to language areas and administered to infants in two well-baby clinics representing different socioeconomic levels in Los Angeles. Data were gathered by interviews with mothers as well as by actual observation ($N = 108$; CA 6 weeks to 68 months). Preliminary findings indicated the expected pattern of adequate grading of difficulty in items. In addition, 34 language-handicapped children were examined. The severely retarded showed a lag in both expressive and receptive items, whereas the emotionally disturbed showed higher receptive and lower expressive items.

Davids, A., Goldenberg, L., and Laufer, M. W.: The relation of the Archimedes Spiral Aftereffect and the Trail Making Test to brain damage in children, *J. Consult. Psychol.*, *21*:429–439, 1957. Fifteen cerebral-palsied children (CA 10, IQ 98) were matched with 29 emotionally disturbed non-brain-damaged children and 24 normal children attending public school. The brain-injured children performed less well than either of the other groups, who resembled each other in their productions. This was true also for Trail A of the Trail Making Test but not for Trail B, where the emotionally disturbed children performed at the same level as the brain-damaged group. Both the SAET and the TMT appear useful in detecting the presence of brain damage in children.

Denhoff, E.: Needs in the field of psychologic appraisal of children with cerebral palsy, *New Eng. J. Med.*, *243*:524–527, 1950. The basic need is to develop simple methods that can indicate the educability and prognosticate the ultimate level of mental attainment. Medical history and examination, formal psychologic tests, and observational techniques by teachers and parents all have equal status in the analysis of the whole child.

Doll, E. A.: Mental evaluation of children with expressive handicaps, *Amer. J. Orthopsychiat.*, *21*:148–154, 1951. Some issues in the evaluation of children with expressive handicaps are raised and illustrated by clinical examples. There is often a tendency to confuse a factual observation with the explanation that is offered for the defective performance. We may, therefore, err in assuming that a child who is penalized by a physical handicap would pass a test item if he were physically intact. In practice, we keep in mind both the actual performance and the handicap and carefully seek out the influence of the handicap as the examination proceeds. The clinician should carefully catalogue the complaint and its history. The Vineland Social Maturity Scale is useful for this. In severely handicapped children to whom the numerous assumptions which underlie a standard psychometric test do not pertain, it is often necessary to rely on clinical observations.

Dunn, L. M., and Harle[illegible] R. K.: Comparability of Peabody, Ammons, Van Alstyne, and Columbia test scores with cerebral palsied children, *Except. Child.*, *26*:70–74, 1959. A comparison of these tests—each of which requires only "yes," "no," or pointing responses—on a sample of 20 cerebral-palsied children in Nashville public schools shows that all appear useful for predicting school success.

Fisher, G. M.: Differences in WAIS verbal and performance IQ's in various diagnostic groups of mental retardates, *Amer. J. Ment. Defic.*, *65*:256–260, 1960. Examination of the protocols of 508 institutionalized retardates who had received all the subscales of the Wechsler Adult Intelligence Scale indicates that diagnostic groups comprising individuals with central nervous system infection and other organic nervous diseases have significantly higher verbal IQ than performance IQ. There is no difference between verbal and performance IQ's in other varieties of mental subnormality.

Frostig, M., LeFever, D. W., and Whittlesey, J. R. B.: A developmental test of visual perception evaluating normal and neurologically handicapped children, *Percept. Motor Skills*, *12*:383–394, 1961. The developmental test discussed includes five areas of visual perception: (1) eye-motor coordination, (2) constancy of form, (3) figure-ground relationships, (4) position in space, and (5) spatial relationships. The test was standardized on a sample of 434 normal children, ages 3½ to 8. It was administered also to 71 children diagnosed as neurologically handicapped or suspected of neurological handicaps (criteria not cited), all of whom had learning difficulties. Perceptual disturbances were found in nearly all of the clinical sample. Analysis of the scatter among the five subtests showed that perceptual difficulties were not uniform. Specific training based on the test results produced clinically observed changes in perceptual ability and subsequent improvement in academic performance.

Gallagher, J. J., Benoit, E. P., and Boyd, H. F.: Measures in intelligence in brain damaged children, *J. Clin. Psychol.*, *12*: 69–72, 1956. Forty institutionalized, mentally defective brain-injured children (CA 7–14) received the Stanford-Binet, Columbia Mental Maturity Scale, and the Leiter International Performance Scale. Although the tests intercorrelate ($r = .85+$), the CMMS was 9 points higher than the Stanford-Binet and the LIPS was 3 points lower. These differences are significant. Caution in the use of the CMMS and LIPS is suggested.

Gibbs, F. A., Gibbs, E. L., Carpenter, P. R., and Spies, H. W.: Electroencephalographic abnormality in "uncomplicated" childhood diseases, *J.A.M.A.*, *171*:1050–1055, 1959. EEG's were obtained from 1298 children admitted to a hospital with diagnoses of measles, mumps, chicken pox, rubella, or scarlet fever. The tracings were studied in relation to clinical evidence of encephalitic processes accompanying these diseases. The body temperature in itself was not a factor, and normal EEG's were obtained in a number of patients whose rectal temperatures exceeded 40° C. (104° F.). Of 717 patients with measles, 37 had evidence of encephalitis and all had abnormal EEG's; of the remaining 680 patients with measles but without clinical evidence of encephalitis, 344 (51%) had abnormally slow EEG's during the acute or immediate-past acute phase of their illness. The probability of brain involvement was greatest at age 3 for measles and chicken pox and at age 2 for mumps. Of the five diseases studied, rubella was the least likely, and measles the most likely, to be accompanied by evidence of encephalitis. In three cases, impairment of intellectual ability and general behavior was noted in spite of a return of the EEG to normal. The number of patients in whom the brain is affected by these diseases is far greater than the number with clinically obvious encephalitis.

Gurevitz, S., and Klapper, Z. S.: Techniques for and evaluation of the response of schizophrenic and cerebral palsied children to the Children's Apperception Test (C.A.T.), *Quart. J. Child Behav.*, *3*:38–65, 1951. Ten schizophrenic children (Bellevue Hospital, N.Y.) and 18 spastic hemiplegic cerebral-palsied children (clinic, Hospital for Special Surgery, N.Y.) were matched for age (5–12) and IQ (normal) and compared on the Children's Apperception Test. The records were compared on 47 characteristics that were derived impressionistically (no reliability data are offered). For the schizophrenic children major trends appeared, moving from close adherence to formal stimuli to departure from them in the form of confabulations. Hostility and anxiety predominated. For the cerebral-palsied children, the major finding was the affectless quality. Only a few consistent trends were noted in analyses of emotional processes. Further research is suggested.

Haeussermann, E.: Evaluating the developmental level of cerebral palsied pre-school children, *J. Genet. Psychol.*, *80*:3–23, 1952. The reasons for trying to find special tests and the requirements of these tests are described. A number of original items are included: presentation of concrete, life-sized objects; large, clear pictures; large pegs of wood in matched pairs of different colors; toy wooden milk bottles; wooden blocks of matched shapes, etc. The administration of these items, their interpretation, and some specific problems in testing cerebral-palsied children are described.

Haeussermann, E.: Estimating developmental potential of pre-school children with brain lesions, *Amer. J. Ment. Defic.*, *61*:170–180, 1956. Whereas an earlier report attempted to describe techniques for circumventing the physical limitations of the cerebral-palsied child, this report is concerned with the deviations in mental, emotional, sensory, and sensory-motor functioning of children with brain lesions. The aims, methods, and underlying principle of using a structured interview with parallel objective and subjective evaluation are described, with illustrations—*e.g.*, testing for body image. An inventory of a child's total functioning and a description of the intactness or nonintactness of the areas of functioning are presented.

Haeussermann, E.: *Developmental Potential of Pre-school Children.* Grune & Stratton, 1958. This manual is concerned with the problem of evaluating the educational potential of handicapped children. Basing her approach on a quarter of a century of experience, the author proposes that the evaluation take the form of a structured interview rather than a standard psychometric test. The purposes of educational evaluation are outlined and a method involving novel stimuli and details of administration is presented in great detail. Instructions regarding what to look for are scattered through the text. The philosophy of the method is "to shift the burden of proof . . . from the child who is being examined to the items which test the level of his comprehension." Although norms and validity data are not presented, the style of examination is different from standard American methods of psychological examination. In addition, the stimuli are designed to minimize the effects of physical handicaps.

Haines, M. S.: Test performance of preschool children with and without organic brain pathology, *J. Consult. Psychol.*, *18*: 37, 1954. A comparison on the Merrill-Palmer test of 100 brain-injured children with 100 foster-home children showed no differences. Children ranged from 3 to 7 years and were matched on the basis of Stanford-Binet intelligence (low average to average). The Merrill-Palmer is therefore not sensitive as a diagnostic tool for brain injury. The author thinks that the negative finding occurs because differentiation of abilities increases with age. Tests at earlier ages may not be sensitive to special deficits.

Halpin, V.: Rotation errors made by brain-injured and familial children on two visual motor tests, *Amer. J. Ment. Defic.*, *59*: 485–489, 1955. Fifteen institutionalized brain-injured children were matched with 15 familial retardates on age (7–13) and IQ (40–72) and administered the Bender Gestalt test and the Goldstein-Scheerer Stick Test. In addition to control for maturational factors in manipulating a pencil, the Bender Gestalt figures were broken down into two elements and the children were asked to put them together. The findings are: (1) brain-injured children show more breakdowns of gestalts on the Bender but not more rotations; (2) they show more breakdowns and rotations on the stick test ($p = .05$); (3) the simplified Bender shows the same results as the original; (4) rotation on the bender is unrelated to rotations on the stick test. The theory is: rotation is a complex, multi-determined phenomenon. Failure to replicate expected findings may be due to the low MA (6 years) used in this study.

Heilman, A.: Intelligence in cerebral palsy: a new interpretation of research studies, *Crippled Child*, *30*:11–13, 1952. Basing her opinion on a review of recent studies, the author feels that intelligence estimates should be revised downward. The need for further research to chart distribution of intelligence among cerebral-palsied children is stressed.

Hohman, L. B.: Intelligence levels in cerebral palsied children, *Amer. J. Phys. Med.*, *32*:282–290, 1953. Much therapeutic effort has been wasted because it has been assumed that cerebral-palsied children are of normal intelligence but fail to test at this level because of their multiple handicaps. The proponents of this view have never been able to document it. After examining the records of 600 cerebral-palsied children, who probably constitute a representative sample (author's statement) in the state of North Carolina, the author concludes that the picture "is a dismal one. . . . At least half of the children are retarded, and 75 percent are below average. These findings are quite stable and pertain at all age levels. Efforts and expenditures of funds might be better spent on the 15 percent of the brighter children rather than on all cerebral palsied."

Hohman, L. B., and Freedheim, D. K.: Further studies on intelligence levels in cerebral palsied children, *Amer. J. Phys. Med., 37*:90–97, 1958. Examination of 1003 cases between 7 months and 16 years of age shows "a tragically" high incidence of retardation. The total number who are educable is probably much less than 40 percent, because among those who have high IQ's many are incapacitated by physical handicaps. We must take a sober look at the limitations inherent in this population.

Hohman, L. B., and Freedheim, D. K.: A study of IQ retest evaluations on 370 cerebral palsied children, *Amer. J. Phys. Med., 38*:180–187, 1959. From a sample of 1000 cerebral-palsied children seen at Duke University Hospital, test-retest data were available at intervals ranging from 6 months to 5 years. The tests were standard individual intelligence tests, prorated so as not to penalize children with severe motor difficulties. From data based on the re-examination of 370 children, the following conclusions are drawn: (1) The levels of IQ on test-retest are the same in more than 75 percent of the cases; in the remainder, there is a shift up or down ten points. (2) Dividing the cases by initial IQ level showed that the smallest change occurred in the 90+ and 50− IQ groups, with the largest shift in the 50–70 range; division of the total sample by age at initial testing indicated fewer shifts in children above age 6. (3) In spite of the relatively large percentage of cases in which IQ shifted more than 10 points, only 30 of 248 cases tested after a one-year interval required a reclassification. The methods used to evaluate the cerebral-palsied child are adequate. (4) Whereas for normal children there is an expected error of ±5 points, for cerebral-palsied it is closer to ±10 because of the handicaps.

Holden, R. H.: Improved methods in testing cerebral palsied children, *Amer. J. Ment. Defic., 56*:349–353, 1951. "This paper has attempted to illustrate a more flexible use of present standardized intelligence tests in order to determine most adequately the intellectual level of a physically handicapped, brain-injured child. . . . Two new tests, Raven's Progressive Matrices and the Ammons Full Range Picture Vocabulary Test, need further evaluation to assess their usefulness in determining the intellectual level of physically handicapped brain-injured children and adults."

Holden, R. H.: The Children's Apperception Test with cerebral palsied and normal children, *Child Devel., 27*:5–8, 1956. Eight cerebral-palsied children (CA 9; MA 7; IQ 73) were compared with 7 normal and 3 neurotic children (CA 7; MA 7; IQ 101) on the CAT. The cerebral-palsied described 61 percent of the cards and made up thema for 39 percent, whereas the controls described 28 percent and made up thema for 72 percent ($p = .01$). Results are interpreted to indicate that CAT is a useful tool for detecting brain injury and that the differences arise because the cerebral-palsied group shows more concrete than abstract behavior.

Irwin, O. C.: A manual of articulation testing for use with children with cerebral palsy, *Cereb. Palsy Rev., 22*:1–24, 1961. This manual attempts to present a reliable, valid, and objective measuring instrument for evaluating the articulatory status of the cerebral-palsied child. Altogether, 1155 children, drawn from a nationwide sample, were used to standardize four short consonant tests and a vowel test, which were reported on separately. The present study is a replication on 147 cerebral-palsied children (CA 3–16) of all five tests treated as an integrated unit. Data on validity and reliability, copies of the test forms, and a demonstration are presented. The results are examined in terms of differences due to sex, CA, MA, IQ, type of cerebral palsy, severity of disability, and proper placement of consonants and vowels. (Data on the separate tests have been reported in *J. Speech Hearing Dis.*, *21*:446–449, 1956; *Cereb. Palsy Rev.*, *12*:18, 1957; *19*:8–10, 1958; *19*:12–14, 1958; *20*:7–9, 1959; *21*: 3–4, 1960.)

Katz, E.: A survey of degree of physical handicap, *Cereb. Palsy Rev.*, *15*:10–11, 1954. The paper presents a graphic form for recording the more obvious disabilities in various categories of functioning. Six areas of functioning are included: (1) vision, (2) hearing, (3) speech, (4) sitting balance, (5) arm-hand use, and (6) walking. Each of these areas is rated on a four-point scale ranging from minimally to severely handicapping. The survey is useful for rapid or large-scale screening.

Katz, E.: Can the mental abilities of cerebral palsied be measured? *Calif. J. Educ. Res.*, *6*:3–8, 1955. This article deals with modifying some of the test items on the Stanford-Binet Scale to make them feasible for cerebral-palsied children. All the items can be grouped according to six major categories: (1) "pointing," (2) "picture vocabulary," (3) number, (4) memory, (5) drawing, and (6) bead stringing. Additional sequences of major items might include three-hole form board, block building, comprehension, and vocabulary. Pointing and picture vocabulary are distributed throughout the range of mental age. This scheme may be useful in making decisions about which items can be used to test the child without penalizing him for his handicap. It may help in correlating behaviorial deficit with brain damage.

Katz, E.: Success on Stanford-Binet Intelligence Scale test items of cerebral palsied children compared with non-handicapped children, *Cereb. Palsy Rev.*, *16*:7–11, 1955. Experience with the traditional Stanford-Binet indicates that it tends to underestimate the child's ability when scored and interpreted literally. On the other hand, it provides valuable information when the items are interpreted separately. It was found that when 62 cerebral-palsied children (CA 2–6, IQ average) were compared with 873 nonhandicapped controls on the basis of what percentage passed each item (age 2 to 6), no statistically significant difference was found in 36 of the 48 test items studied. The controls were superior in the remaining 12 items. Test items involving pointing, picture vocabulary, and number found the two groups equal. Memory and drawing items yielded slight differences between the groups. Motor coordination items yielded major differences.

Katz, E.: The "pointing modification" of the Revised Stanford-Binet Intelligence Scales, Forms E and M, Years II through VI: a report of research in progress, *Amer. J. Ment. Defic.*, *62*:698–707, 1958. This is a proposed procedure for adapting this test for the young cerebral-palsied child. The examiner carries out some of the tasks and the child indicates by voice or gesture whether the procedure has been properly accomplished. In some instances, some changes in the test material must be made to obtain a meaningful response. It will be necessary to standardize the modified test items so that more difficult items may be assigned higher mental age levels, whereas easier items may be assigned lower mental age levels.

Kogan, K. L.: A method of assessing capacity in preschool cerebral palsied children, *J. Clin. Psychol.*, *13*:54–56, 1957. The Children's Picture Information Test was designed for use with preschool cerebral-palsied children. It is based on a multiple-choice task of 34 sets of items. Correlating the results of 50 children with those achieved on the Stanford-Binet yielded an *r* of .82. The sample ranged in age from 2 to 7 with IQ's from below 50 to 110. Administering the test to 10 severely handicapped children yielded mental ages from 2 to 5, indicating that the test is sensitive to individual differences within a cerebral palsy population.

Kogan, K. L.: Repeated psychometric evaluations of preschool children with cerebral palsy, *Pediatrics*, *19*:619–622, 1957. Test scores based on the Cattell Infant Intelligence Scales or the Stanford-Binet are reviewed for 31 children with cerebral palsy who had two or more examinations administered according to standard instructions within a three-year period. The average shift from one examination to another was 6.5 IQ points. The age at initial examination was 2 to 6 years; the average IQ was 73. It is likely that the changes in test scores are attributable to chance and that the intelligence quotient is no less consistent for disabled children than it is for normal children.

Kogan, K. L.: Standardization of the children's Picture Information Test, *J. Clin. Psychol.*, *16*:405–411, 1959. The Children's Picture Information Test was administered to 400 children divided equally into 8 six-month age-interval groups ranging from 2½ to 6 years. The groups were selected so that they approached as closely as possible an optimal distribution of sex, age in months, and parents' occupation. Both mean and median total scores increased from each age group to the adjacent higher age group. Discrimination between adjacent age groups was significant between ages 2½ and 5½. CPIT performance was not related to sex or parents' occupation. For 50 subjects selected from the standardization population, the *r* between CPIT and Stanford-Binet was .89. For 59 handicapped children (type not cited), the *r* was .80. Test-retest reliability for 50 subjects was .93. Normalized standard scores are presented. It is suggested that the test is useful for evaluating cerebral-palsied children.

Koppitz, E. M.: Diagnosing brain damage in young children with the Bender Gestalt test, *J. Consult. Psychol.*, *26*:541–547, 1962. The Bender Gestalt test was administered to 384 public-school children aged 5 to 10 years and was scored according to a scheme devised by the author. 103, diagnosed as brain damaged (based on medical criteria not cited), had no serious physical, motor, or mental retardation, and the remaining 281 subjects, matched for age and sex but not IQ, served as controls. The total Bender scores, as well as individual items, can differentiate significantly between subjects with and without brain damage. The diagnostic value for each given deviation on the Bender varies according to the subject's age. Most brain-damaged subjects do poorly, regardless of their IQ. Good Bender records are very rare among brain-damaged subjects and occur almost exclusively among children with at least average intelligence.

Kralovitch, A. M.: A study of differences on the Cattell Infant Intelligence Scale between matched groups of organic and mongoloid subjects, *J. Clin. Psychol.*, *15*: 198–199, 1959. Twenty-eight brain-injured children (CA 8) were matched with mongoloids for age, sex, social class, and length of residency at the North New Jersey Training School at Totowa. Both groups achieved mental age scores between 1 and 1½ years. Differences were most optimal at MA 5–8 months. Brain-injured children tend to be less competent in motor skills.

Krout, M. H.: Is the brain-injured a mental defective? *Amer. J. Ment. Defic.*, *54*:81–85, 1949. The psychologist should first employ a standard global intelligence test. If the results are below average, medical examination for the presence of physical handicaps is suggested. "Then he might proceed to discover the presence or absence of organic brain involvement." Then will follow the selection of a "true intelligence" test and projective techniques.

Lacey, H. M.: Pre-conditions for the psychological evaluation of young cerebral palsied children, *Cereb. Palsy Rev.*, *23*:12–14, 1962. An adaptive approach to appraising intellectual abilities, which considers the factors outside the test that influence the results, is presented. Variables such as personality and physical disability are examined along with the specific influences of set, motivation, and fatigue as well as previous experience with testing. Other variables considered are the examiner, the test items and instructions, and extrinsic factors such as the testing room and the presence of the parent during the testing.

Maisel, R. N., Allen, R. M., and Tallarico, R. B.: A comparison of the adaptive and standard administration of the Leiter International Performance Scale with normal children, *Cereb. Palsy Rev.*, *23*:3–4;16, 1962. To test the theory that special adaptations of a test to eliminate the effects of impairment due to a disability yield the same results as the full scale, the LIPS was administered to 46 normal children (CA 5–11). Sixteen participated in a reliability study, 30 received half the items of the LIPS under normal conditions, and half pointed to the correct response. Results indicate that the modified version yields the same findings as the original.

McCarthy, J. J.: A test for the identification of defects in language usage among young cerebral palsied children, *Cereb. Palsy Rev.*, *21*:3–5, 1960. A test for the identification of language defects is being developed at the Institute for Research on Exceptional Children, University of Illinois. Each of the 9 subtests is designed to measure a single ability derived from Osgood's theory of communication. The resulting profile should be useful in remediation. A number of doctoral studies (Sievers, Gallagher, and McCarthy) indicate that the test has promise.

Mecham, M. J.: Measurement of verbal language development in cerebral palsy, *Cereb. Palsy Rev.*, *21*:3–4, 1960. A test for language development derived from interviewing parents of cerebral-palsied children had been applied previously to mentally defective and to normal children. The rationale, norms, reliability, and validity of the test are reviewed. Data on application of the test to cerebral-palsied children are presented. In general, scores are related more to mental age than to motor handicaps.

Quast, W.: The Bender Gestalt: a clinical study of children's records, *J. Consult. Psychol.*, *25*:155–162, 1961. On the basis of presenting complaints, 50 children in a psychiatric treatment hospital who were suspected of being brain-damaged were compared with 50 children suspected of being emotionally disturbed. The children were matched on socioeconomic status and age (10–12). Although the emotionally disturbed group was brighter (IQ 100 vs. 82), it had previously been demonstrated that IQ did not affect performance on the Bender Gestalt. A priori selection of 17 attributes normally not occurring after age 8 showed 10 of these to differentiate the groups at the .01 level. False positive "organic" signs occurred in but one discriminating attribute. The 10 attributes had low positive correlations, suggesting a variety of defects rather than a unitary defect.

Richards, T. W.: Movement in the fantasy of brain-injured (cerebral palsied) children, *J. Clin. Psychol.*, *14*:67–68, 1958. Lundin's Projective Movement Sequence was administered to 32 cerebral-palsied children (CA 4–20) and 32 controls matched for age, sex, and IQ. The groups were essentially similar.

Richards, T. W., and Hooper, S.: Brain injury at birth (cerebral palsy) and perceptual responses during childhood and adolescence, *J. Nerv. Ment. Dis.*, *123*:117–124, 1956. Thirty-two cerebral-palsied children were matched with controls on age (11 years) and verbal IQ (WISC 97). The cerebral-palsied group were drawn from a treatment center in Biloxi, Miss., and the controls came from similar social and economic backgrounds in New Orleans. On the Rorschach test, the cerebral-palsied children were less productive quantitatively and qualitatively and had fewer responses and poorer form level. They exhibited greater caution and less spontaneity, seeing parts of people rather than whole people, and less overt movement. Five Piotrowski signs were given by more than half the cerebral-palsied group and one-fourth of the controls. "Blind" identification is accurate, but there is a tendency to consider dull control children as brain-injured and bright brain-injured children as normal.

Richards, T. W., and Lederman, R.: A study of action in the fantasy of physically handicapped children, *J. Clin. Psychol.*, *12*:188–189, 1956. Of 66 handicapped children (42 boys and 24 girls, CA 13, IQ 96) attending the Illinois Children's Hospital School in Chicago, 14 were cerebral palsied. Data on controls are not cited. On the Levy Movement Inkblot test, the cerebral-palsied group showed less activity, less energy, and less cooperation in their movement projections.

Richardson, E. J., and Kebler, F. J.: Testing the cerebral palsied: a study comparing the Stanford-Binet, Raven's Progressive Matrices, and the Ammons Full Range Vocabulary tests for use with cerebral palsied children, *Except. Child.*, *21*:101–103;108–109, 1954. Advantages of using these tests are discussed; data are presented from a study of 32 cerebral-palsied children. Although the correlations are sufficiently high to warrant use of either of these tests separately (with a preference for the Ammons), the most acceptable procedure, in view of the results, is to give each child both tests.

Rosvold, H. E., Mirsky, A. F., Sarason, I., Bransome, E. D., Jr., and Beck, L. H.: A continuous performance test of brain damage, *J. Consult. Psychol.*, *20*:343–351, 1956. Evidence from EEG studies and Hebb's theories suggests that brain-damaged people would perform poorly on tests requiring sustained attention or alertness. A continuous performance test (CPT) was devised, requiring the subject to press a key every time the letter *X* or the letter *X* preceded by *A* was viewed on a revolving drum. Three groups were tested: adults of normal intelligence, adult retardates, and children of normal intelligence. Each group was subdivided into brain damaged and non-brain damaged. There were 19 brain-damaged children (CA 9, IQ 102) and 26 non-brain-damaged children. The test correctly identified 84 to 90 percent of the brain-damaged children and 77 percent of the controls. It was slightly less discriminating among the adults. The test is "sufficiently reliable and yields sufficiently large differences between subgroups to suggest that they might . . . be useful as a clinical instrument."

Rowley, V. N.: An analysis of the WISC performance of brain damaged and disturbed children, *J. Consult. Psychol.*, *25*: 553–560, 1961. When 30 brain-damaged children seen in a pediatric clinic were matched with respect to sex, CA, and full-scale IQ with 30 emotionally disturbed children seen in a psychiatric clinic, no differences in intelligence-test patterns were uncovered. The minimum IQ was 83.

Rowley, V. N., and Baer, P. E.: Visual retention test performances in emotionally disturbed and brain-damaged children, *Amer. J. Orthopsychiat.*, *31*:579–583, 1961. The Visual Retention Test performances of 25 nondefective, emotionally disturbed children (CA 12, IQ 92) were compared with those of a brain-damaged group (mostly postinfection in origin) who were matched for age and IQ. Four percent of the emotionally disturbed children and 28 percent of the brain-damaged made grossly defective performances in comparison with the norms for chronological and mental age. When compared with the norms, however, the emotionally disturbed children showed an unduly high proportion (8) who performed at the borderline level. Defective performance is therefore due not to emotional disturbance but to brain damage.

Sarason, S. B., and Sarason, E. K.: The discriminatory value of a test pattern with cerebral palsied defective children, *J. Clin. Psychol.*, *3*:141–147, 1947. In a previous study, a psychometric profile that discriminated good and bad emotional adjustment in familial retardates was thought to be similar to a test profile that purported to distinguish brain-damaged from non-brain-damaged people. The group with the profile suggestive of brain damage had abnormal EEG's. In this study of 17 cerebral-palsied children, 8 had psychometric profiles indicative of brain damage: *i.e.*, the Stanford-Binet score was higher than the Kohs blocks and the form level of the Rorschach test was variable. Six of these 8 had abnormal EEG's. In contrast, where the Kohs blocks was higher than the Stanford-Binet and the Rorschach form level was adequate, 7 of the 9 cases had normal EEG's. The former group probably had cortical damage, the latter subcortical damage. The study illustrates the importance of qualitative analysis of test data and the relationship of EEG and behavior.

Shaw, M. D., and Cruickshank, W. M.: The Rorschach performance of epileptic children, *J. Consult. Psychol.*, *21*:422–425, 1957. The Rorschach test was administered to 25 epileptic children in institutions and matched controls in institutions (CA 14, IQ 81). There were no differences between the groups. The failure to confirm the alleged indicators of epilepsy on the Rorschach test may be due to the use of rigorous controls and statistical comparisons rather than subjective impressions; or it may have resulted from confining the study to one homogeneous category of epilepsy instead of lumping together all types of patients regardless of etiology.

Sievers, D. J.: A study to compare the performance of brain-injured and non-brain-injured mentally retarded children on the differential language facility test, *Amer. J. Ment. Defic.*, *63*:839–847, 1959. The Differential Language Facility Test is derived from Osgood's theory of communication and was standardized on normal children in nursery school. Mental retardates with MA from 2 to 6 years who were diagnosed as brain injured on the basis of (1) infections, (2) birth history, (3) toxins, (4) hydrocephalus, (5) postnatal influences, and (6) epilepsy were compared with familial retardates in a state school. The 100 controls exceeded the other groups in over-all language ability. This appeared to increase with mental age. They were also higher in subtests requiring expression without semantic meaning. The non-brain-injured retarded were higher than the brain-injured on subtests involving the making of semantic connections between visual objects. The findings, in the main, support those of McCarthy, who compared normal with cerebral-palsied children, but contradict those of Gallagher, who did not group his subjects according to MA levels.

Truss, C. V., and Allen, R. M.: Duration of the spiral after-effect in cerebral palsy: an exploratory study, *Percept. Motor Skills,* *9*:216–218, 1959. "In this exploratory study of the duration of the spiral after-effect, it was found that mean reported duration was quite variable among both normal and organic (CP's) S's, and seemed to depend, in part, upon motivation and choice of criterion of termination of the after-effect." Use of the ratio of the durations following 30 ten-second exposures eliminated significant differences found between groups using mean duration of the after-effect, as the ratio appears to be substantially independent of the criterion. The intrasubject variability in duration of the after-effect for ten-second exposures was significantly greater for organics than for normals.

3. CHARACTERISTIC MECHANISMS AND NATURAL HISTORY

Achilles, R. F.: Communicative anomalies of individuals with cerebral palsy, *Cereb. Palsy Rev., 16*:9–10, 1955; *17*:19–26, 1956. Definition and detailed analyses of speech problems is presented. 90 athetoids are compared with 61 individuals with other types of cerebral palsy. Tables are presented on 12 anomalies, including breathing, laryngeal, tongue, mandibular function, teeth and palate, face and head, neck and trunk, vision, hearing, aphasia, and general factors. Athetoids present a somewhat greater number of deviations than other types of cerebral palsy. The study was based on a survey of children's records (CA 2–22).

Asher, P.: A study of 63 cases of athetosis with special reference to hearing defects, *Arch. Dis. Child., 27*:135;475–477, 1952. Of 63 cases of athetosis, there was a history of neonatal jaundice in 34. Of 24 jaundice cases who were tested, 22 had hearing defects whereas only 4 of the 18 nonjaundiced had such defects. Deafness may often be mistaken for mental deficiency. Clinical estimates of intelligence of athetoids are less accurate than of spastics. This study was carried out at the Birmingham (England) Children's Hospital.

Barnett, C. D., Ellis, N. R., and Pryer, M. W.: Learning in familial and brain injured defectives, *Amer. J. Ment. Defic., 64*:894–900, 1960. From six previously conducted learning studies (oddity problem, object quality discrimination, mirror drawing, rotary pursuit, image learning, and serial verbal learning), subjects were re-evaluated to separate the organics (defined on the basis of family history of normal intelligence coupled with a significant incident that may have contributed to the condition) from familial defectives (defined on the basis of family history of mental deficiency, no known developmental incident, and no organic signs). The groups averaged MA 7 years and CA 17 years, with the organic group excluding the grossly physically impaired. The groups were then subjected to the Yerkes double alternation problem. Familials were significantly superior on the serial verbal learning and Yerkes alternation. An attempt to reconcile some disparate findings from earlier studies is presented, along with a survey of the literature.

Barsch, R. H.: The concept of regression in the brain-injured child, *Except. Child., 27*:84–89;93, 1960. The brain-injured child lives in a perceptually unstable world. Under stress he tends to regress. A brief survey of more than 200 records shows that regression may be induced by many situations. Examples of regressed behavior are cited. During periods of regression, the child is not encouraged to learn anything new but, rather, to fall back on safe, familiar habits and easy tasks. Regression may be manifested in many ways. Suggestions for developing a continuum of sensitivity to stress are offered in the form of a five-point rating scale based on degrees of sensitivity to change.

Barsch, R. H.: Explanations offered by parents and siblings of brain-damaged children, *Except. Child., 27*:286–291, 1961. 119 children (CA 4–12) attending a cerebral palsy clinic in Milwaukee were divided into four groups on the basis of four areas of primary defect: behavior, symbol formation, immaturity, and sensori-motor ability. Most of the parents of all groups used the term "brain injury" freely, except where the child's functioning level was near normal. Some parents used the term "cerebral palsy" even where such a diagnosis had not been made. The nature and severity of the disturbance did not affect the parent's explanation. Siblings tend to adopt the explanation of the parents. Their explanations generally don't pose a problem in the eyes of the parents.

Barsch, R. H.: Rearing practices of parents of children with cerebral palsy in toilet training, *Cereb. Palsy Rev.*, *23*:12–16, 1962. Demographic data on 51 parents of cerebral-palsied children are presented. Comparing the findings on toilet-training practices with those reported by Sears *et al.* (R. Sears, E. Maccoby, and H. Levin, *Patterns of Child Rearing,* Row, Peterson and Co., 1957), it was found that mothers of cerebral-palsied children begin toilet training later and take more time (*e.g.*, only 23 percent report success after one year). Mothers expect little from the child and are encouraged in this by professionals. No ingenious approaches or special techniques to bypass the handicapping conditions are reported. Most mothers do not view toilet training as a particular or unique problem. Fathers play a secondary role. Nocturnal bedwetting is controlled at a rate close to normal (Sears *et al.*). Bowel and bladder training is seen as an anxiety-laden area for parents of cerebral-palsied children.

Barsch, R. H., and Rudell, B.: A study of reading development among 77 children with cerebral palsy, *Cereb. Palsy Rev.*, *23*:3–13, 1962. Seventy-six patients of the Cerebral Palsy Clinic of Milwaukee (CA 5–16) who were attending school were evaluated on a comprehensive battery of reading tests. Six percent read above their age or grade level, 25 percent were at their level, and 69 percent were below their level (by at least 1 year). Various relationships between type of reading problem and medical, psychological, and educational variables are presented. Major findings indicate that inarticulation was a factor in only 25 percent of this group; in 75 percent, reading level was directly related to IQ; more than half the group were managing in the development of a basic sight vocabulary and were acquiring a system for new words. Hemiplegics did better than other groups.

Beck, H. S.: The incidence of brain injury in public school special classes for the educable mentally handicapped, *Amer. J. Ment. Defic.*, *60*:818–822, 1956. The incidence of brain injury in classes for educable mentally handicapped was estimated in two ways to determine whether both methods would give the same results: (1) by examining the number of cases referred for neurological examinations in the whole southern area of Illinois, taking the number actually examined and the incidence of brain-injury diagnosis resulting from this procedure, and (2) by taking a single complete EMH population in one school district and obtaining neurological evaluations on all the children. Of 252 children in the former group, 60 percent were estimated to be brain injured. Of 45 in the second group, 67 percent were brain injured. Thus, both methods indicate that between 60 and 70 percent of children in EMH classes are brain injured. In the organic group, the ratio of boys to girls is 2:1, in the nonorganic group, 1:1.

Beck, H. S.: Comparison of convulsive organic, non convulsive organic, and non organic public school children. *Amer. J. Ment. Defic.*, *63*:866–875, 1959. Neurological workups were available on 160 children (CA 9–10) examined by a school psychologist in southern Illinois. The children, referred for placement in classes for the educationally handicapped, had a mean IQ of 62 and were divided into three groups: (1) convulsive-organic ($N = 60$) on the basis of history of seizures or EEG findings; (2) non-convulsive-organic ($N = 71$) on the basis of evidence of brain damage but without seizures; and (3) nonorganic ($N = 29$). They were compared on the WISC, Bender Gestalt test, developmental history, and Strauss behavior check list. The CO group (IQ 59) showed fewer WISC gains on retest, more variability, and more frequent poor maternal health during pregnancy. The NCO group (IQ 60) showed fewer decreases in verbal IQ on retest and more increases in performance IQ on retest. The group also used fewer colors in drawing a house, had more unrecognizable Bender Gestalt figures, stood alone later, and had more feeding problems during infancy. The NO group (IQ 72) had higher performance than verbal tests, better Bender Gestalt drawings, better muscular coordination, and fewer developmental problems. The author claims that the CO group resembles the type of child described by Strauss. Developmental data and teacher ratings are included, even though their reliability is not established, on the grounds that "it is better to make the best of a poor situation than sit back and do nothing while waiting for the ideal situation."

Belmont, L., and Birch, H. G.: The relation of time of life to behavioral consequence in brain damage: I. The performance of brain-injured adults on the marble board test, *J. Nerv. Ment. Dis., 131*:91–97, 1960. In a study of marble-board behavior of 20 hemiplegics who sustained brain injury late in life and a group of children with early damage (studied originally by Werner), it was found by the method of pseudocomparison (*i.e.*, comparison of each experimental group with its control by using the difference between each brain-damaged group and its control) that the brain-injured children showed a greater deficit in a visual construction task than the brain-injured adults. The brain-injured children tend to be more incoherent in their approach. Time of life, therefore, does have a bearing on the effects of brain damage.

Bender, L., and Silver, A.: Body image problems of the brain-damaged child, *J. Soc. Issues, 4*:84–89, 1948. The body image develops from (1) biologic laws of growth and (2) integration of new experiences, physical and psychological, arising from one's self and from relationships and attitudes of others, into a gestalt. This image is continually being modified at various levels of development, perception, or integration, and may be altered by either organic or psychologic events. The body image of the brain-damaged child is disturbed by tonus pulls, equilibrium problems, perceptual and integrative difficulties, and social inadequacy. His physical disability is very real. It is by recognizing the disability and by understanding his body-image needs and satisfying them that improvement in the prognosis of the brain-damaged child can be made possible.

Bensberg, G. J., Jr.: A test for differentiating exogenous and endogenous mental defectives, *Amer. J. Ment. Defic., 54*:502–507, 1950. Thirty-one exogenous retardates were matched with an equal number of endogenous retardates (MA 88 months, CA 20 years) in a study designed to replicate the classic marble-board study of Werner and Strauss. For the most part, their findings were confirmed. The brain-injured group was less accurate and made more jumps than the control. However, both scores were related to mental age in both groups, indicating that test interpretation must be qualified by norms if it is to be used to diagnose the presence of brain injury.

Bensberg, G. J., Jr.: The relation of academic achievement of mental defectives to mental age, sex, institutionalization, and etiology, *Amer. J. Ment. Defic., 58*:327–330, 1953. "Records of 274 male and 230 female mental defectives who had been administered the American School Achievement Test and Revised Stanford-Binet were investigated to find the influence of variables which might influence achievement. . . . Females matched with males on the basis of CA and MA were found to achieve significantly higher than the males, both in arithmetic and reading. No differences in achievement were found between patients of the same ages who had attended the institution school for five years or longer and those who had attended public schools prior to commitment. No differences in achievement were found between brain-injured defectives and familial defectives."

Berger, A.: Inhibition of the eyelid reflex in three etiologic groups of mentally retarded boys as compared with normals, *Train. Sch. Bull., 51*:146–152, 1954. Data and results of a study attempting to differentiate between normal children and individuals whose mental retardation is due to brain damage, inheritance, and/or psychogenic factors are presented. It was assumed that a well-integrated and undamaged central nervous system is necessary to inhibit the eye-blink reflex and that those with organic damage would have the greatest difficulty in inhibiting the reflex. None of the differences between retarded groups was significant, except for a comparison of the organic and familial groups in partial inhibition.

Berko, M. J., and Berko, F. G.: Implications of language difficulties in the cerebral palsied adult, *Cereb. Palsy Rev., 14*:11, 1953. Motor speech deficit is one aspect of a total language problem which also includes distortions in experiencing the world. Distortions in experiencing visual stimuli occur in approximately 40 of 100 cerebral-palsied children and adults seen by the author. Defects in visual perception include geometric agnosia, figure-background disturbances, and defects in perceptual integration. The importance of these defects in reading and real life situations is illustrated.

Bijou, S. W., and Werner, H.: Language analysis in brain-injured and non-brain-injured mentally deficient children, *J. Genet. Psychol., 66*:239–254, 1945. Nineteen brain-injured boys (CA 14, IQ 68) who were matched with non-brain-injured controls received 57 vocabulary words. The brain-injured boys had a superior vocabulary, both qualitatively and quantitatively. It is concluded that the inferiority of brain-injured subjects on grouping and sorting tasks is due not to an inferiority in concept formation but to pathological dynamisms which appear in unstructured situations.

Birch, H. G., and Belmont, L.: The relation of time of life to behavioral consesequence in brain damage: II. The organization of tactual form experience in brain-injured adults, *J. Nerv. Ment. Dis., 137*:489–495, 1960. Twenty adult hemiplegics did less well than 20 non-brain-damaged physically handicapped patients on a task of tactual reproduction in the face of background interference. When the data were compared with those on children originally reported by Werner, it was discovered that the brain-injured child shows a relatively greater deviance from the control than the adult hemiplegic. This may be owing to a mild impairment in the adult control group due to aging.

Birch, H. G., and Demb, H.: The formation and extinction of conditioned reflexes in "brain-damaged" and mongoloid children, *J. Nerv. Ment. Dis., 129*:162–169, 1959. Conditionability and rate of extinction of conditioned galvanic skin reflex of two groups of brain-injured children, a group of mongoloid, and a small group of normal children, were studied. The brain-injured hyperactive children ($N = 10$; IQ 59; CA 10) required a larger number of paired presentations of light and shock to reach the criterion for conditioning than did a group of nonhyperactive children ($N = 8$; IQ 57; CA 10). Mongoloid children required a longer conditioning period than either group. While no differences in number of extinction trials existed, qualitative approaches emerged. The hyperactive group gave little evidence of internal inhibition and even increased their activity level, whereas half the children in the other groups demonstrated internal inhibition by falling asleep. Conditioned-reflex theory can explain the results which indicate that the population of brain-injured children is not homogeneous.

Block, W. E.: Personality of the brain injured child, *Except. Child., 21*:91–100, 1954. In a comparison of 20 spastics with 18 athetoids of normal intelligence by means of a battery of projective tests, case histories, and functional evaluation scales, no significant differences were found.

Boles, G.: Personality factors in mothers of cerebral palsied children, *Genet. Psychol. Monogr., 59*:159–218, 1959. Sixty mothers of cerebral-palsied children were matched with 60 mothers of nonhandicapped children. They were matched on 10 variables and were subdivided so as to represent mothers of younger and older children, and mothers of Catholic, Jewish, and Protestant faiths in equal amounts. On the basis of self-administered attitude questionnaires designed specifically for this study, mothers of cerebral-palsied children proved more overprotective and had more marital conflicts. Mothers of older children in both groups were more guilty, rejecting, and unrealistic. Mothers of younger cerebral-palsied children were more withdrawn. Catholic mothers in both groups were more guilty, unrealistic, and socially withdrawn than Jewish mothers. Jewish mothers provide significantly more social opportunities than Catholic or Protestant mothers. Detailed discussion of the intercorrelations of the seven characteristics examined on the questionnaire is presented.

Bortner, M., and Birch, H. G.: Perception and perceptual-motor dissociation in cerebral palsied children, *J. Nerv. Ment. Dis., 130*:49–53, 1960. Twenty-eight cerebral-palsied children (CA 8–18, IQ 64) received the block-design test. On three consecutive designs where the subject had failed, he was presented with a correct copy of the model, his own incorrect version, and a standard inaccurate copy. In 79 percent of the 89 failures, the correct copy was selected. Furthermore, copying the design took 88 seconds, whereas discriminating it took 12 seconds. This indicates discrimination ability may be intact although synthetic, integrative processes are impaired in brain-injured persons.

Breakey, A. S.: Ocular findings in cerebral palsy, *Arch. Ophthal.*, *53*:852–856, 1955. Fifty-six of 100 unselected patients showed ocular defects. Abnormalities of muscle balance were most prominent. Management by treatment and surgery is described.

Burks, H. F.: The effect of brain pathology on learning, *Except. Child.*, *24*:169–172, 1957. In this review of recent work in brain physiology and his own work with children with reading disabilities, the author is concerned with faulty pattern-making attempts of the brain due to poor physiological integration. In earlier studies of 137 school problem children of the acting-out type in comparison with 94 controls, he found that the group with abnormal EEG's showed perceptual academic problems, whereas the normal EEG group showed difficulties in emotional-social areas, although both were poor readers. The former showed defects on verbal intelligence scales, the latter on tasks requiring attention. The hypothesis is offered that the former group suffers from a cortical disturbance and the latter suffers from disturbance of the diencephalon, which is related to disturbance in the reticular activating system. Evidence for this hypothesis, including the negative findings on the EEG of the subcortical group, is presented.

Byrne, M. C.: Speech and language development of athetoid and spastic children, *J. Speech Hearing Dis.*, *241*:231–240, 1959. Language development and articulation skills in 74 cerebral-palsied children (CA 2–7), all of whom were considered educable, were evaluated. An equal number of spastics and athetoids, with disability ranging from mild to severe and intelligence from retarded to above average, were used. Most used oral language; the rest depended on gestures. The children developed first the skills appearing earliest in normal children. All were delayed in achieving proficiency in speech and language items. Spastics achieved higher scores than athetoids, but the differences were not significant. Methods of testing are described.

Cassel, M., and Riggs, M.: Comparison of three etiological groups of mentally retarded children on the Vineland Social Maturity Scale, *Amer. J. Ment. Defic.*, *58*:162–169, 1953. Sixty boys at Vineland Training School (CA 9–15, IQ 40–76) were divided into three groups—definitely organic, definitely familial, and unexplained—and their competence evaluated on the Vineland Social Maturity Scale. Familials were relatively competent in all areas. Organics were relatively incompetent in all areas. The unexplained cases had a well-defined pattern of competence in some areas but not in others. Organics were particularly poor in visuo-motor items and items pertaining to organizing the social environment. The unexplained group did poorly in items requiring effort, dependability, responsibility, and contribution to the community.

Cassel, R. H.: The effect of mental age and etiology on two factors in the formboard performance, *J. Clin. Psychol.*, *5*:398–404, 1949. Eight endogenous and 15 exogenous boys (CA 11, MA 5) received a modified formboard test where all the objects were (1) circular, to maximize the effects of speed and minimize the effects of form perception, and (2) permitted to drop through the bottom of the Witmer formboard so that each person would continue to have the same number of choices as the problem-solving progressed. Findings indicate that: (1) formboard performance consists of two independent factors—motor speed and form perception; (2) differences at higher age levels are due primarily to motor speed; (3) the endogenous group performs better on total formboard score, form-perception score, and motor-speed score; (4) form perception is related to maturation in the endogenous group but not clearly related to MA in the exogenous group. Conclusion: mental retardation is not a homogenous condition.

Child Neurology and Cerebral Palsy; Little Club Clinics in Developmental Medicine, No. 2, London Medical Advisory Committee of the National Spastics Society, 1960. This collection consists of 42 brief papers that were presented at the Second National Spastics Society International

Study Group at Oxford. Topics range from spinal cord and polymyographic studies, metabolism of the developing brain, the first-year neurology and development, paresis, and nonmotor defects in cerebral palsy to the results of treatment in cerebral palsy to parents, patients, and doctors. Although the vast majority of the participants came from England, a number from the United States, continental Europe, and South Africa participated also.

Cobrinik, L.: Performance of brain-injured children on hidden-figure tasks, *Amer. J. Psychol., 72*:566–571, 1959. Normal and cerebral-palsied children were compared on a variety of hidden-figure tasks. Normals exceeded brain-injured in all tasks. Performance for both groups improves with age. Those with severe motor impairment do less well. IQ is not related to the ability to detect hidden figures. Impaired performance on hidden-figure tasks is probably related to the extent, rather than location, of brain damage. The hidden-figure tasks were developed especially for this study. They may be useful devices for studying some types of figure-ground disturbances.

Cohen, P., and Hannegan, H. M.: "Aphasia" in cerebral palsy, *Amer. J. Phys. Med., 35*:218–223, 1956. In a large number of cases at a cerebral palsy clinic, 22 had language difficulties resembling aphasia in adults, which may be called "aphasoid" or aphasia-like. Most were athetoids whose brain damage was the result of kernicterus. No constant EEG pattern was found. Characteristic appearance, gait, eye difficulty, and emotional pattern are described.

Cotton, C. B.: A study of the reactions of spastic children to certain test situations, *J. Genet. Psychol., 58*:27–44, 1941. Twenty-six spastic cerebral-palsied children were matched with normal controls (CA 9, MA 9) and compared on (1) a series of 13 sorting situations, (2) a completion test involving concrete, pictorial, and verbal materials, (3) a light-pattern memory test, and (4) a string pattern test. The spastics differed from the controls by showing: (1) a wider range of individual differences in type of response within any one test situation, with bizarre responses present; (2) a greater tendency toward more concrete types of response with less ability to shift toward the more abstract forms of behavior; (3) a greater tendency toward stereotyped responses no matter what the nature of the test situation. "There seems to be evidence that these children are affected by their cortical injuries in somewhat the same fashion as are cases of brain injury after maturity."

Cruse, D. B.: "The Effects of Distraction upon the Performance of Brain-injured and Familial Retarded Children," in *Readings on the Exceptional Child,* by E. P. Trapp and P. Himelstein. Appleton-Century-Crofts, 1962. No differences appeared when 24 brain-injured retardates were compared with non-brain-injured retardates (CA 14, MA 6) in a visual-reaction experiment under distraction and non-distraction conditions. However, when the brain-injured group was subdivided into two groups, one with determinate and known etiology ($N = 18$) and the other with indeterminate etiology ($N = 6$), the former had significantly longer mean reaction times. Although brain-injured children with known etiology appear to be more distractible than either familial retardates or children with indeterminate etiology, there seems to be little difference in their ability to benefit from a minimization of environmental distractions. The findings confirm those of Gallagher. (*Monogr. Soc. Res. Child Develop., 22*:2, Serial No. 65, 1957. See also Bensberg, G. J., and Cantor, G. N., *Amer. J. Ment. Defic., 62*:634–637, 1957).

de Hirsch, K.: Two categories of learning difficulty in adolescence, *Amer. J. Orthopsychiat., 33*:87–91, 1963. There are at least two categories of intelligent adolescents with severe learning difficulties who are usually grouped together when in fact they are different. In Group A, the academic difficulty is related to ego impairment and is a manifestation of a severe character disorder indicating primary learning disabilities. In Group B, scholastic dysfunction is secondary to residual language deficiencies, and psychological problems as well as difficulties in school are the result, rather than the cause, of the disability. The differences between the groups and their methods of management make accurate diagnosis mandatory.

Denhoff, E., and Holden, R.: Family influence on successful school adjustment of cerebral palsied children, *Except. Child.*, *20*:5–8, 1954. A follow-up study of 33 children attending school after receiving evaluation and treatment in a preschool setting indicates that two-thirds were making an adequate adjustment to regular class, special class, or home teacher. One-third were not. Good adjustment appears to be related more to family acceptance than to intelligence or severity of disability. Indications for type of school placement and a check list of the characteristics of the "good" family are listed as a guide to clinical management.

Doll, E. A.: "Behavioral Syndromes of CNS Impairment," in *The Exceptional Child*, eds. J. F. Magary and J. R. Eichorn. Holt, Rinehart & Winston, 1961. An attempt is made to contrast the behavior symptomatology of cerebral palsy, exogenous mental deficiency, and neurophrenia. In neurophrenia, behavior is "organically driven. Posture and movement reveal awkwardness rather than orthopedic handicap. Intellectual functioning reveals deficiency or disharmony. Disturbances in speech, language, visual and auditory perception, rhythm, laterality, attention, emotions, conduct, learning, social competence, concept formation, retention, effort, and the integrity of behavior, are manifested." Neurophrenia simulates exogenous mental deficiency but is more amenable to therapeutic management, although all areas of functioning are affected. For the time being, the concept of neurophrenia remains at a level of clinical observation and the methods of management are still experimental.

Dolphin, J. E., and Cruickshank, W. M.: The figure-ground relationship in children with cerebral palsy, *J. Clin. Psychol.*, 7:228–231, 1951. Thirty cerebral-palsied children (CA 10; MA 9.5; IQ 93) were compared with matched controls on two tests of figure-background relationship, one an embedded figure test and the other a multiple-choice embedded figure test. The cerebral-palsied were inferior in both tasks. The findings confirm those of Werner and Strauss and appear to result from the phenomenon of forced responsiveness to extraneous stimuli and overmeticulousness in brain-damaged children.

Dolphin, J. E., and Cruickshank, W. M.: Pathology of concept formation in children with cerebral palsy, *Amer. J. Ment. Defic.*, *56*:386–392, 1951. Thirty cerebral-palsied children (CA 10; MA 9.5; IQ 93) were compared with matched controls. Cerebral-palsied children were inferior in responding to the Picture Object Test, designed to measure differences in concept formation.

Dolphin, J. E., and Cruickshank, W. M.: Visuo-motor perception in children with cerebral palsy, *Quart. J. Child Behav.*, *3*:198–209, 1951. Thirty cerebral-palsied children (CA 10; MA 9–15; IQ 93) were matched with controls and were given the marble-board test. The cerebral-palsied children were inferior in their method of approaching a problem. Background of the test was a distracting element, which constantly interfered with construction of patterns by the cerebral-palsied. Their approach was more incoherent than constructive or global. Qualitative differences were more striking than quantitative. A second experiment, using mosaic patterns to be copied from a marble board, yielded essentially the same results. Clinical observation: The cerebral-palsied children made bizarre designs and the controls tended to oversimplify designs.

Dolphin, J. E., and Cruickshank, W. M.: Tactual motor performance of children with cerebral palsy, *J. Personality*, *20*:466–471, 1952. Thirty cerebral-palsied children (CA 10; MA 9.5; IQ 93) were matched with controls on a figure-ground test of tactual motor performance. The cerebral-palsied children did less well. Differences in responses were still greater when a highly structured background was used.

Eames, T. H.: The relationship of birth weight, the speeds of object and word perception, and visual acuity, *J. Pediat.*, *47*: 603–606, 1955. Summarizing previous studies in this series (*J. Educ. Res.*, *38*:506, 1945; *Amer. J. Ophthal.*, *29*:57, 1946; *Amer. J. Ophthal.*, *38*:850, 1954; *Brit. J. Ophthal.*, *37*:312, 1953; *Amer. J. Ophthal.*, *21*:1370, 1938), the author states that prematures ($N = 158$) show more visual problems when tested at ages 5 to 9 than controls ($N = 439$), and visual acuity is related to speed of perception. In a comparison of 25 pupils (prematures) whose

birth weight was under 5.5 lb. with controls ($N = 25$) whose birth weight was over 5.5 lb. on visual acuity (Snellen method) and speeds of object and word perception as measured by a tachistoscope, the interrelationships among these variables was much higher for the premature group than for the control group. Prematurity must, therefore, be considered as a possible handicap to learning, although "It must be stated that there are individual differences in response to prematurity just as there are in diseases, learning, and memory."

Elkan, D.: Development of the aphasic child: a case study, *Volta Rev.*, *57*:71–72, 1955. This is the case history of a 5½-year-old boy, believed to have had poliomyelitis at the age of 3. Methods used in teaching him to talk are presented. Although sensory and motor centers appeared greatly impaired, some residual hearing was present.

Feldman, I. S.: Psychological differences among moron and borderline mental defectives as a function of etiology: I. Visual-motor functioning, *Amer. J. Ment. Defic.*, *57*:484–494, 1953. Fifty-four exogenous retardates were matched with 54 endogenous retardates in a state training school (CA 10–37, Mean 23, IQ 53). The criterion for exogenous retardates was the presence of neurological signs. Exogenous retardates performed less well on the Pascal Suttel scoring scheme for the Bender Gestalt. Performance on this task was correlated with MA for both groups to a significant extent. Although both groups do less well than normals, the exogenous group showed more perseveration, failure to complete difficult designs, and failure to overlap figures. The Bender Gestalt may, therefore, "prove to be more predictive than Strauss criteria" for the presence of brain injury and prognosis. An incidental finding: First-born in both groups did less well than non-first-born.

Flores, P. M., and Irwin, O. C.: Status of five front consonants in the speech of cerebral palsied children, *J. Speech Hearing Dis.*, *21*:238–244, 1956. In teaching consonants *p*, *b*, *m*, *d*, and *t* to cerebral-palsied children, verbal stimulation elicits more correct responses than pictorial stimulation in the medial position than at the beginning and end of a series. In comparing the positions for ease of eliciting responses, the initial, the medial, and the final were of increasing difficulty.

French, E. L.: A system for classifying the mentally deficient on the basis of anamnesis, *Train. Sch. Bull.*, *47*: Supplement p. 40, 1950. "The usefulness of the new classification system for research is indicated by the findings that groups classified by it as familial and nonfamilial show significant differences in measures from the Heath Rail-Walking Test, the Cassel modification of the Witmer Formboard Test, and the Ellis Designs Test. These differences are in the same directions as differences formally reported on the basis of diagnosis of endogenous and exogenous. . . ."

Gallagher, J. J.: A comparison of brain injured and non-brain injured mentally retarded children on several psychological variables, *Monogr. Soc. Res. Child Develop.*, *22*:2, Serial No. 65, 1957. After a careful review of the literature on the perceptual, intellectual, and personality characteristics of brain-injured children, a study is presented wherein 24 brain-injured retardates at a state school in Illinois (CA 7–14, IQ 35–76) were matched with a control group of nonretardates. No differences were found in learning ability. The brain-injured group was slightly inferior in some perceptual tasks (*e.g.*, marble board) but not others (memory for designs). In language, the brain-injured group was superior in verbal imitative responses but poorer in making associations and integrating verbal concepts. The brain-injured group was more hyperactive, fearful, and less popular. Conclusion: Some differences between the groups exist, but not enough to warrant drastically modified educational programs. In short, on the whole, similarities outweigh differences.

Guibor, G. P.: Some eye defects seen in cerebral palsy, with some statistics, *Amer. J. Phys. Med.*, *32*:342–347, 1953. In general, the eyes respond to cortical injury in the following ways: (1) horizontal conjugate deviation without limitation of movement, (2) horizontal conjugate deviation with limitation of movement, (3) nasal turning of one or both eyes, and/or (4) temporal turning of one or both eyes.

Motor defects of the eyes occurred in 75 percent, subnormal vision in 25 percent, and the eyes turned inward toward the nose in 51 percent of cerebral-palsied persons. Treatment of 142 patients over a nine-year period has been less successful than with patients with similar eye defects who did not have cerebral palsy.

Guibor, G. P.: Cerebral palsy: a practical routine for discerning oculomotor defects in cerebral palsied children, *J. Pediat.*, *47*:333–339, 1955. More than half of cerebral-palsied patients have ocular defects. Early treatment develops vision and may improve general motor ability, especially in patients with athetosis or ataxia. A series of simple tests for the nonspecialist are described, with indications as to when referral to the specialist is desirable.

Halpin, V. G., and Patterson, R. M.: The performance of brain-injured children on the Goldstein-Scheerer test, *Amer. J. Ment. Defic.*, *59*:91–99, 1954. Fifteen "brain-injured" institutionalized children (CA 10; MA 5–8; IQ 54) were matched with 15 familial retardates on a test battery including the Arthur Point Scale, Goodenough Draw-A-Man, and Vineland Social Maturity Scale. In a number of dimensions of performance, both groups scored the same on the Goldstein-Scheerer tests; however, a number of differences were observed. The brain-injured group had particular difficulty on the stick test, mostly in breakdown of the gestalts and increased rotations ($p = .05$). The findings are analyzed in a careful, detailed way that raises a number of interesting points, *e.g.*, the possibility that the brain-injured child fails a task for a reason different from the familial, and why some brain-injured do well and others do not.

Hardy, W. G.: Aphasia in children, *J. Ontario Speech Hearing Assoc.*, *1*:1–4, 1960. Aphasia in children may include impaired hearing together with problems of learning and memory. Auditory discrimination, pattern perception, and the EEG should be investigated. Several hypotheses concerning cerebral functioning are offered. Diagnostic teaching is useful. Diagnostic testing is always in order.

Harrower-Erickson, M. R.: Personality changes accompanying organic brain lesions: III. A study of pre-adolescent children, *J. Genet. Psychol.*, *58*:391–405, 1941. Three 12-year-old boys with established brain lesions were examined preoperatively. The Rorschach record was interpreted "blindly," *i.e.*, without any other data. Two of the boys were examined postoperatively. They appeared improved on all tests. The cases are presented in detail to illustrate the correlation of psychological and anatomical data and also to demonstrate the usefulness of psychological tests, particularly the Rorschach, in studying brain-damaged individuals.

Hohman, L., Baker, L., and Reed, R.: Sensory disturbances in children with infantile hemiplegia, triplegia, and quadriplegia, *Amer. J. Phys. Med.*, *37*:1–6, 1958. Forty-seven children (CA 6–16) of average-to-superior intelligence were studied on 13 sensory tasks. 72 percent showed sensory defects. The major defect appears to be of the cortical parietal lobe variety (loss of form sense, two-point discrimination, and position sense). Sensory losses in other modalities may also be present (hemionopsia, light touch, sharp and dull, hot and cold, measuring ability, wet and dry, rough and smooth). When losses occurred in parietal modalities, cortical modalities showed losses also. Other findings: Very small areas of the hand may be involved, although the rest of the hand is intact. Fifteen cases showed underdevelopment of the involved side. This fits Penfield and Roberts' theory that damage to the parietal lobe before the second year leads to a shortened extremity.

Holden, R. H.: Motivation, adjustment, and anxiety of cerebral palsied children, *Except. Child.*, *24*:313–317, 1958. Two studies were carried out at a preschool cerebral palsy center (CA 3–6). I. 35 preschool children were rated by a psychologist, a nursery school teacher, an occupational therapist, and a physical therapist on five-point scales of motivation, adjustment, and anxiety. Results: 15 were rated low in motivation. 12 of these (80%) were poorly adjusted and highly anxious. Well-motivated children, however, are evenly distributed on both ends of the adjustment and anxiety scales. Reliability of the scales was high, with 94 percent agreement within one point in a sample of 10 cases. II. The 10 most motivated and 10 least motivated (unbeknown to the judges) were rated on improvement. A high relationship

between judgment of progress and motivation is indicated ($r = .79$). Judges agreed on progress in 17 of the 20 cases.

Hood, P. N., and Perlstein, M. A.: Infantile spastic hemiplegia: II. Laterality of involvement, *Amer. J. Phys. Med., 34*:457–466, 1955. In a sample of 334 left and right hemiplegics, there were no differences in rate of language and motor development and intelligence. This is in sharp contrast to the bulk of the previous literature which is reviewed. Right hemiplegics tend to have a greater birth weight than left hemiplegics.

Hopkins, T. W., Bice, N. V., and Colton, K. C.: *Evaluation and Education of the Cerebral Palsied Child: New Jersey Study,* Council for Exceptional Children, 1954. A detailed summary of medical and psychological findings as well as educational procedures developed in New Jersey from 1936 to 1951 is presented. Data and comparisons of physical and psychological characteristics of the four major types of cerebral palsy are examined on a large number of cases ($N = 1406$, CA 1–21). The teaching methods and counseling carried out at the A. Harry Moore School in Jersey City are discussed. The findings by individual psychological tests and special problems and their administration are presented.

Hunt, B., and Patterson, R. M.: Performance of brain-injured and familial mentally deficient children on visual and auditory sequences, *Amer. J. Ment. Defic., 63*:72–80, 1958. Both types of mentally defective children were tested on the perception of visual and auditory sequences and ability to arrange materials in both types of sequences. Results indicate that teaching methods should be altered to facilitate the use of cues from the area least handicapped. Children should be classified on the basis of disability as well as by mental and chronological age.

Kahn, E., and Cohen, L. H.: Organic driveness: a brain stem syndrome and an experience, *New Eng. J. Med., 210*:748–756, 1934. Cases are presented in which hyperkinesis due to surplus of inner impulsion is the predominating feature. This is termed "organic driveness." Its association with neurological signs referrable to the brain-stem indicates the locus of its genesis in this region. Restlessness, clumsiness, and explosive motor release of voluntarily inhibited activity are secondary to the hyperkinesis. "Organic driveness" is found in various encephalopathies, notably encephalitis epidemica, but its incidence in various degenerative diseases of the nervous system, as well as the probable existence of constitutional types, is emphasized. Various differentiating criteria from the hyperactivity of hypomanic and euphoric individuals are discussed. It is in accordance with his personality make-up that the hyperkinesis and the "organic driveness" are experienced by the individual. This classic paper is followed by a discussion which questions the evidence for implicating the brain stem, the lack of autopsy material, the possibilities of cortical damage touching off release phenomena, and the role of personality in adapting to the driveness.

Kastein, S., and Hendin, J.: Language in development in a group of children with spastic hemiplegia, *J. Pediat., 39*:476–480, 1951. "A thorough study of 67 case histories of children with spastic hemiplegia seems to indicate that the development of language is based on the mental potential rather than on the severity or side of impairment (lesion) or handedness. Among the cases with average intelligence or above, the incidence of right and left hemiplegia is equal."

Kelloway, P., Crawley, J. W., and Kagawa, N.: A specific electroencephalographic correlate of convulsive equivalent disorders in children, *J. Pediat., 55*:582–592, 1959. A study of 550 patients (from birth to 16 years of age) showing the EEG pattern known as 14 and 6 per second positive spikes has shown that this pattern is a particular correlate of convulsive equivalent disorders in children and provides objective laboratory evidence to support such a diagnosis. The high incidence of paroxysmal attacks of headache, abdominal pain, and behavioral and autonomic disturbance may be considered the basis of a specific clinical syndrome. It has its greatest incidence between ages 4 and 15 but may occur at any age. Prognosis for spontaneous remission and response to anticonvulsant drugs is good.

Kelly, E. M.: Educational implications in the public school special class of the

endogenous-exogenous classification, *Amer. J. Ment. Defic.*, *54*:207–211, 1947. Two groups of 13 special-class children (CA 10–12), divided into exogenous vs. endogenous, received the Vineland Social Maturity Scale and were described by their teachers. There were some differences in profiles between the groups; however, the data were not submitted to statistical tests, so that it is difficult to tell whether these differences are significant. In the teachers' descriptions, the picture fits that suggested by Doll.

Keller, J. E.: "The Use of Certain Perceptual Measures of Brain Injury with Mentally Retarded Children," in *Readings on the Exceptional Child*, by E. P. Trapp and P. Himelstein. Appleton-Century-Crofts, 1962. In an attempt to replicate earlier findings of Werner and Thuma (1942), from which they concluded that brain-injured boys are unable to perceive apparent motion and have low critical flicker-frequency thresholds, all the boys ($N = 100$) at the Wayne County Training School (CA 11–14, IQ 48–102) were reexamined on these measures. Since 42 percent of the boys at Wayne County Training School showed positive neurological signs on Strauss's previous examination and the Werner-Thuma studies showed clear-cut differences between groups, it was expected that a bimodal distribution would occur. It was found that (1) the original techniques could not be replicated, so that modifications had to be made in the apparent motion apparatus; (2) in contrast to Werner and Thuma's findings, all subjects saw apparent motion; (3) the variation in critical flicker-frequency thresholds was considerably less than Werner and Thuma reported; (4) the two measures (CFF and apparent motion) are not correlated. Explanation for the failure to replicate are offered.

Kennard, M. A.: The characteristics of thought disturbances as related to electroencephalographic findings in children and adolescents, *Amer. J. Psychiat.*, *115*:911–921, 1959. A multidisciplinary examination of 200 children (CA 7–16) in a mental hospital revealed that organic brain disorders, as indicated by history and behavioral patterns, have a strong positive association with EEG abnormality (83%). Although this is to be expected, it is surprising in view of the absence of neurological signs in most of the cases. Thought disorders in children with no sign of organic brain disturbance were accompanied by EEG abnormality in 40 percent of the cases compared with 23 percent of nonthought disorders.

Klapper, Z. S., and Werner, H.: Developmental deviations in brain-injured (cerebral palsied) members of pairs of identical twins, *Quart. J. Child Behav.*, *2*:288–313, 1950. "Three pairs of identical twins . . . were studied to investigate the effect of birth injury to the brain on development. . . . Seven test situations were employed, comprising standardized tests of intelligence and personality, and special tests designed for the diagnosis of developmental deviations of various psychological functions. . . . In spite of great variability, the modifications of behavior found in the cerebral-palsied twins are essentially of the same type described in previous studies of brain-injured children without motor handicap. . . . Findings concerning such modifications, and the part they play in the total clinical picture, are pertinent to any attempt at prognosis. . . ."

Knott, J. R.: EEG and behavior, *Amer. J. Orthopsychiat.*, *30*:292–298, 1960. This paper is a survey of the application of the EEG since its discovery in 1929 to a number of clinical problems, including the study of individual differences in personality, psychiatric diagnosis, and intelligence. A number of studies suggest that EEG disturbances occur in children diagnosed as having primary behavior disorder. Recent work on learning indicates that the integrity of an organism's behavior depends on the intactness of a critical zone in the midbrain area. Need for more careful analysis of behavior, as well as correlation with biochemical changes in the brain, are indicated.

Lamm, S., and Fish, M. L.: Intellectual development of the cerebral palsied child as a factor in therapeutic progress, *Amer. J. Ment. Defic.*, *59*:452–458, 1955. A study of 99 cerebral-palsied children at a clinic ($N = 73$) and public school ($N = 26$) confirms findings of others that approximately three-fourths have IQ's below 90. Progress, as measured by ratings of individual staff members (reliability of the scales not cited), appears to be related to IQ in the clinic group ($p = .01$) but not in the school group. In 5 high-IQ children who showed no progress, psychiatric problems predominated. Unlike other studies, the IQ levels of the spastic and athetoid group do not differ; also, an unusually high percent (88) of athetoids showed progress.

Lending, M., Slobody, L. B., Stone, M. L., Hosbach, R. E., and Mestern, J.: Activity of glutamic-oxalacetic transminase and lactic dehydrogenase in cerebrospinal fluid and plasma of normal and abnormal infants, *Pediatrics, 24*:378–387, 1959. The activity of the enzymes glutamic oxalacetic transminase (GOT) and lactic dehydrogenase (LDH) in the cerebrospinal fluid and plasma was studied in 54 normal, full-term, newborn infants from 2½ to 240 hours of age and in 20 newborn infants suspected to have intracranial pathology. The normal range of activities of these enzymes is described. In infants with suspected intracranial pathology, average GOT activity of cerebrospinal fluid was 82 percent higher than in the normal newborn infant, and plasma GOT activity had an 18-percent mean increase over normal. In the cerebrospinal fluid of the abnormal infants, LDH activity had a mean increase of 309 percent over normal, and plasma LDH activity an increase of 11 percent over normal. Enzyme determinations in cerebrospinal fluid, particularly LDH, may be useful in the study of newborn infants suspected of intracranial pathology.

Lesky, J.: Aphasia in childhood, *J. Ontario Speech Hearing Assoc., 2*:5–7, 1960. A three-fold classification is used: (1) "acquired" after speech and language has been developed, (2) "developmental" owing to a delay in conceptual organization related to speech, and (3) "pure" or "congenital" where the localized lesion is probably bilateral or subcortical. Symptoms that act as a guidepost in diagnosis are listed. Treatment of congenital aphasia involves the entire family over a period of time. Left untreated, the child will level off with an odd word or two, or jargon. Developmental aphasics will learn to talk in concrete terms but show gaps in comprehension. Start therapy early using a visual, kinesthetic, and tactile multidisciplinary approach. If no progress follows after a year of treatment, the child should be treated as if he were deaf.

Linde, T.: Accent on assets—two problems in psychology and cerebral palsy: Part one. Individual personality, *Cereb. Palsy Rev., 23*:3–4;11, 1962. Four areas of adjustment problems are presented along with anecdotal material from the United Cerebral Palsy Association of Milwaukee. These are: frustration, guilt, inferiority, and idolization. They lead to anxiety. It is important to distinguish between objective inability to adjust and that stemming from deep social bias. The rehabilitation worker can clarify and give information in regard to the objective inability and point out the asset components. Stress on asset over comparative-valuing systems is suggested.

Linde, T.: Accent on assets—two problems in psychology and cerebral palsy: Part two. Social interaction, *Cereb. Palsy Rev., 23*:5–7;19, 1962. What makes people evaluate one another favorably or unfavorably? The answer is: positive and negative expectancies based on experiences. This finding in social psychology is applied to cerebral-palsied people with illustrations.

Luria, A. R.: An objective approach to the study of the abnormal child, *Amer. J. Orthopsychiat., 31*:1–17, 1961. Failure in school may be due to emotional conflict, feeblemindedness (*i.e.,* "brain injury" in the intrauterine period), malnutrition, and partial defects. It is, therefore, important to diagnose correctly the reasons for school failure. Vigotsky's principle of a "zone of potential development,"—*i.e.,* the possibility of enhancing a child's performance through helping him—is diagnostically useful. A method for studying the distinctions between hearing, listening, and thinking is presented. This is based on a technique for measuring the constriction of a blood vessel in response to a stimulus. Semantic generalization is a useful technique also. The psychometric approach is unrewarding. Arthur Benton, as a discussant, indicates that there may be differences between Russian and American psychologists; *e.g.,* the former pay more attention to the asthenic child, the latter to the emotionally disturbed. Americans are more similar to Russian psychologists in their wish for objective methods and their objections to single-score psychometric approaches than Luria indicates.

Mark, H. J.: Two symptoms pathognomonic for congenital cerebral communication disorders in children, *J. Pediat.*, *55*:391–396, 1959. Failure to make "expected responses" to sound, irrespective of intensity level and total absence of speech, are almost always pathognomonic of central nervous system dysfunction. Failure to respond may be called a disturbance in orienting or alerting responses to social stimuli. It is pathognomonic at all age levels. Sometimes it is not noticed until 18 months, because failure of the auditory system to serve more complex communication functions may even disorganize previously learned auditory functions. Absence of speech is secondary to inability to comprehend spoken language in the thousands of children seen at the Johns Hopkins Hearing and Speech Center. It is on an organic, not a psychogenic, basis and is different from peripheral hearing impairment. Little is known about the prognosis in these two conditions.

Mark, H. J., and Hardy, W. G.: Orienting reflex disturbances in central auditory or language handicapped children, *J. Speech Hearing Dis.*, *23*:237–242, 1958. There seems to be a relationship between disorganized learning processes and orienting reflex disturbances in children with central auditory or language disorders due to brain injury present since birth. A study of 36 children suggests that orienting reflex disturbances may not appear until as late as 3 or 4 years of age. The inability of the auditory system to serve more complex communicative functions gives rise to disorganized learning processes. This, in turn, explains the extinction of a previously present orienting reflex. Hence, the disturbance may not be manifest soon after birth.

Mark, H. J., and Pasamanick, B.: Asynchronism and apparent movement thresholds in brain-injured children, *J. Consult. Psychol.*, *22*:173–177, 1958. Ten brain-injured children (pyramidal trait involvement but no ophthalmological pathology) were compared with 10 controls equated for age, IQ, and sex. The brain-injured were slower and more variable in reporting (1) when two flashing lights (which were not simultaneous) were not seen as simultaneous (asynchronism), (2) apparent movement, and (3) peripheral two-point thresholds. Although the differences were statistically significant (.01), they were not sharp enough to be used as a diagnostic tool.

McMurray, J. G.: Rigidity in conceptual thinking in exogenous and endogenous mentally retarded children, *J. Consult. Psychol.*, *18*:366–370, 1954. In a large institution for mental retardates, 15 exogenous were matched with 15 endogenous on age (10–20), IQ (40–70), and sex. Each received a modified form of the Wisconsin Card-Sorting Test. The exogenous showed evidence of greater rigidity by manifesting more perseveration and by requiring more time and a greater number of responses to sort to a correct principle.

McPherson, M. W., and Fisch, R. L.: Affect in the etiology and maintenance of mental deficiency, *J. Clin. Psychol.*, *11*:55–60, 1955. "This study was designed to determine the characteristics, incidence, and possible etiological sources of mental defectives' evasive attempts to respond to difficult items on the Wechsler-Bellevue Scale, Form I. . . . Children with the lower MA's evidenced evasion consistently more frequently than did the subjects with higher MA's. . . . There is evidence to suggest that the phenomenon might reflect an attitude of learned negativism. The relatively low incidence of evasive responses suggests that experimental antecedents of this type will elucidate only one type of mental deficiency."

Mednick, S. A., and Wild, C.: Stimulus generalization in brain damaged children, *J. Consult. Psychol.*, *75*:525–528, 1961. Cerebral-palsied children ($N = 18$) showed less stimulus generalization than a matched control group on a task requiring a voluntary response along a visual-spatial dimension. This explains the "concrete" behavior of the brain-injured child from a learning-theory standpoint. Implications for training are suggested.

Murphy, M. M.: Comparison of developmental patterns of three diagnostic groups of middle-grade and low-grade mental defectives, *Amer. J. Ment. Defic.*, *61*:164–169, 1956. Forty mongoloids (CA 15) were compared with 40 familial retardates (CA 16) and 38 brain-injured (CA 14). IQ's were in the 20's. Unlike higher grade defectives, all groups showed equal verbal and motor development. The average developmental levels of the brain-injured and mongolian groups were quantitatively similar and inferior to the familial group, but the mongolian group was qualitatively similar to the familial group. Results appear to support Benda, who classifies mongolism as exogenous because of damage to the pituitary gland during the fetal period.

Myklebust, H. R.: Aphasia in children, *Except. Child., 19*:9–14, 1952. Aphasia is described along with its common causes. For special education, it is recommended that children be classified separately and trained through the use of appropriate remedial methods and techniques.

Nelson, C. D.: Subtle brain damage: its influence on learning and language, *Element. School J., 61*:317–324, 1961. The hyperactive, "driven" child with brain damage has been well described. Often overlooked is the child with subtle damage that is manifested by learning and adjustment problems. A number of language tasks and examples of how the "subtly brain-damaged" child responds to them are mentioned: (1) sequence difficulties, (2) familial language disorder, (3) confused cerebral dominance, (4) perseveration, (5) writing and spelling disturbances, (6) poor sound discrimination, (7) difficulty in abstract behavior. Cautious observations using the team approach is stressed.

Nelson, T. M.: A study comparing visual and visual-motor perceptions of unimpaired, defective, and spastic cerebral palsied children, *J. Genet. Psychol., 101*:299–332, 1962. With a two-dimensional diamond as a stimulus, subjects were required to match the target in 8 purely visual situations and 3 visual-motor situations. Quality of response varied with chronologic and mental age for all groups and tasks except in the cerebral-palsied group ($N=16$; CA 5–12; MA 3–11) where the r between visual performance and CA was —.11 for the spastic group. The tasks could be graded in order of difficulty for all groups. When the groups were equated for MA, the defective group ($N=20$; CA 6–12; MA 3–9) exceeded the others on higher level visual tasks and the spastics were the poorest. These findings suggest that: (1) quality of purely visual performance is dependent on neurophysiologic maturation within the visual pathway, (2) mechanisms of the visual pathway seem involved in spastic cerebral palsy and cause a developmental lag, and (3) characteristics of responses to flat copy reflect a host of variables, making them poorly suited for clinical situations.

Nielson, H. N.: *Visual-Motor Functioning of Cerebral Palsied and Normal Children.* Ejnar Munksgaards Forlag, Copenhagen, 1962. Twenty hemiplegic and 20 paraplegic spastic cerebral-palsied children, ages 6–15 years, were matched with 40 controls on MA, sex, parents' social status (not defined), and IQ. All but 6 of the spastics and 6 of the controls had IQ's above 90 (this is an atypical sample of spastic children). On the Bender Visual Motor Gestalt Test, the Goldstein-Scheerer Test, and the Rey Labyrinth Test, the experimental group performed less well. The Bender and Rey tests were most discriminating in the higher IQ ranges, because both groups showed deviant performance in the lower ranges. Differences were also greatest between 6 and 8 years, implying a slower rate of maturation in the spastic children or a tendency to compensate with age. The lag may be manifested in school achievements (17 of 24 spastics on whom data were available were classified as slow learners). Interrelationships between tests was low: 40 percent of the spastics and 73 percent of the controls showed no abnormal signs. There is no typical brain-injured child. EEG findings correlate with the Bender.

Oki, T., Sakai, T., Kisu, M., and Higashi, H.: A comparative study concerning the psychological traits of children with organic brain damage and subnormal oligophrenia, *Jap. J. Child Psychiat., 1*:126–134, 1960. The Bender Gestalt test was administered to 17 organic, oligophrenic children, 17 subnormal children, and 135 normal children. Visual-motor function of the oligophrenic children was found to be inferior and their marks fluctuated depending on the figures offered. "There was a striking disintegration of the contents of their copied figures. Their understanding of the figures was sporadic and fragmentary, lacking coherence as a whole. In addition, their order of drawing was found to be extremely incoherent."

Osborn, W. J.: Associative clustering in organic and familial retardates, *Amer. J. Ment. Defic., 65*:351–355, 1960. Familial and organic retardates (CA 10–30) were matched with normals (MA 5–11, IQ 45–70) and compared with respect to their functioning on the associate clustering task. In recalling the content of 32 pictures, the three groups showed no differences in clustering effects. There were qualitative differences, however, in the manner in which the retardates developed their total scores, suggesting inefficiencies in functioning which may be related to inappropriate learning habits. Both groups of retardates showed more variability than the normals.

Paak, E. B.: Measures of ability in a preacademic group of brain-injured children, *Amer. J. Ment. Defic., 59*:220–225, 1954. To solve the problem of "where to start" in educating the brain-injured child whose IQ range is 40 to 60, CA 8 to 10 years, and MA 4 to 6 years, an academic inventory was devised. An "abilities check list" comprising 15 titles (*e.g.,* visual matching and visual discrimination followed by specific observation), is described. More than half the article consists of the items and record sheet.

Pascal, G. R., and Zax, M.: Double alternation performance as a measure of educability in cerebral palsied children, *Amer. J. Ment. Defic., 59*:658–665, 1955. Hunter's classical double alternation problem, originally devised for animals, has been adapted for cerebral-palsied children. It has been suitable in overcoming many difficulties due to expressive handicaps. For a sample of 24 children studied intensively by three observers over a one-year period, a correlation of .64 between the test and the observations was obtained. Biserial correlation of passing or failing the problem was .74. Performance was not related to CA.

Perlstein, M. A., Gibbs, E. L., and Gibbs, F. A.: The electroencephalogram in infantile cerebral palsy, *Amer. J. Phys. Med., 34*:377–397, 1955. In an EEG study of 1217 consecutive cases, it was observed that seizures occur in nearly half the cases. The incidence and nature of the seizures are described for the varieties of cerebral palsy. Very abnormal EEG's occur in 90 percent of the cases having seizures and 44 percent not having seizures. Differences of EEG patterns with age, laterality of clinical findings, and a sample of unselected epileptics are described in detail.

Perlstein, M. A., and Hood, P. N.: Infantile spastic hemiplegia, *Amer. J. Phys. Med., 34*:391–407, 1955. A study of 334 spastic hemiplegics (CA 1–20) revealed that: (1) The ratio of right to left hemiplegia was 5:4; the two groups were equal in intelligence and age of acquiring speech. (2) Negroes did not differ from whites except in a greater incidence of postnatal acquisition and seizures which may be due to socioeconomic factors. (3) The incidence of seizures was much greater than that previously reported in the literature, occurring more often in acquired cases and in those with lower IQ. (4) The onset of walking and talking was related to IQ, but they were not related to each other.

Perlstein, M. A., and Hood, P. N.: Infantile spastic hemiplegia: intelligence, *Pediatrics, 15*:676–682, 1955. A study of 334 patients was made with respect to age distribution, race, sex, presence of seizures, side of involvement, and time of onset in regard to intelligence.

Perlstein, M. A., and Hood, P. N.: Infantile spastic hemiplegia: intelligence and age of walking and talking, *Amer. J. Ment. Defic., 61*:534–542, 1957. In 334 infantile spastic hemiplegics, the mean IQ was 77, with 28 percent achieving scores below 65. There was a delay of 9 months in walking and 6 months in sentence acquisition. Sex and side of hemiplegia did not affect the results. Individuals with acquired hemiplegia had the same intelligence as congenital hemiplegics, although they tended to walk and talk a little faster. Seizures occurred in 43 percent of the cases and were associated with lowered intelligence and delay in walking and talking. Mental deficiency appears to be more important than seizures in delay in motor and language development.

Pond, D. A.: Psychiatric aspects of epileptic and brain-damaged children, *Brit. Med. J., 2*:1377–1382;1454–1459, 1961. These two lectures were delivered before the Royal College of Physicians, London. The first discusses current concepts, prevalence, intelligence and personality, drug effects, and treatment of epilepsy. The second lecture covers the brain-damaged child, including criteria for the presence of brain damage. Data from a survey of 58 cases are presented to illustrate the nature of the evidence for brain damage, intelligence, social class and environment, age of onset, and the relationship between personality traits and parental attitudes. The effects of environmental events prior to brain damage and findings from animal studies are presented. The latter are necessary because of the poverty of our methods of studying the brain in people. A careful, critical survey of the literature is woven into the discussion.

Robinson, C. L.: "An Analysis of Understanding and Cooperation as it Depends upon Communication Between the Meeting Street School and Parents of Children Enrolled There." Master's thesis, Boston University, 1951. The role of communication in promoting parents' understanding of the cerebral-palsied child and his needs was studied. Aims were to determine (1) parents' understanding of goals of the nursery school, (2) degrees of cooperation given by parents to the school, (3) extent of relation between levels of understanding and degrees of cooperation, (4) areas where there is misinformation or lack of information, and (5) effectiveness of existing communication methods.

Rudel, R. G., Teuber, H. L., Liebert, R., and Halpern, S.: Localization of auditory midline and reactions to body tilt in brain-damaged children, *J. Nerv. Ment. Dis.*, *131*:302–309, 1960. A comparison of 72 cerebral-palsied children (CA 5–17) matched with controls for age and sex for whom data were available from a previous study revealed that in setting a sound source to the midline while the body is tilted, brain-damaged children lagged behind normal children. In setting the auditory midline, differences emerged only in adolescence. On the other hand, a starting position error was noted in brain-damaged persons at all ages. The extent of the starting position error is apparently related to extent of neurologic impairment. Similarities and differences between this study and prior work on brain-damaged adults are reviewed.

Sato, C.: Musical aptitude of cerebral palsied children, *Cereb. Palsy Rev.*, *22*:3–8, 1960. In a study of 107 cerebral-palsied children on a standard test of musical aptitude (the Tanaka test) it was found that, although "their expressions in music are full of errors and their quality is poor, their aptitude is by no means inferior." The findings and their relationship to the disability, the methods and problems of test administration, and a number of questions about the musical aptitudes of the children are discussed in detail.

Sato, C.: The change of voice in cerebral palsied boys, *Cereb. Palsy Rev.*, *23*:7–11, 1962. A study of the vocal pitch range of 26 cerebral-palsied boys (CA 13–21) over a period of several years revealed that vocal pitch range became lower in 15 cases, narrower in 3 cases, did not change in 3 cases, rose in 4 cases, and was not determinable in 1 case. Cerebral-palsied children have narrower and lower pitch ranges than normal children, and their ranges do not descend conspicuously. Although athetoids with difficulties in phonation begin to change at normal ages, it takes a longer time for their voices to become steady. Changes in countenance appear at about the same time as change in voice.

Sato, C.: A study on rhythm patterns of cerebral palsied children, *Cereb. Palsy Rev.*, *22*:7–11, 1962. Two tests were administered to 125 cerebral-palsied children (first to sixth grade) in a Tokyo school for physically handicapped children: (1) a time reproduction test, *i.e.*, reproducing a beat to two musical phrases, and (2) a speed adaptation test, *i.e.*, reproducing the beat when a phrase was speeded up. Success on both tests was achieved only by mildly handicapped children with high intelligence. No athetoids succeeded in both tests. Success on the test appears to be related to improvement through training. Different patterns of success and failure on the combinations of tasks point to important correlations in rhythm patterns. Scoring scheme, methodology, and results are presented.

Satter, G., and Cassel, R. H.: Tactual kinesthetic localization in the mentally retarded, *Amer. J. Ment. Defic.*, *59*:652–668, 1955. A comparison of three groups of 20 retardates (CA 14, IQ 60) classified as to etiology by the Riggs and Cassel method with a group of 20 normals showed that (1) brain-damaged retardates made most errors in six tactile localization tasks in different parts of the body, whereas the normals made the least; (2) the brain-damaged group was not more variable in its judgment, contrary to hypotheses derived from supposed effects of distractibility.

Schulman, J. L., Thorne, F. M., and Caspar, J. C.: Studies on distractibility: a progress report, *Train. Sch. Bull.*, *59*:142–149, 1963. Four new tasks presumed to be sensitive to distractibility, defined as an ability to attend to a moving unpredictable target, are described: (1) the clock test, (2) the box test, (3) the card test, and (4) the tone test. Two pilot studies were performed on 40 retarded children (CA 6–16, IQ 40–79) and 19 retarded children (CA 5–7, IQ 43–89). The former group was chosen on the basis of the teacher's ratings of most and least distractible. All four tests appear highly reliable ($r = .74$ to $.91$). They also are significantly related to one another ($p = .01$) and to the teacher's ratings ($p = .01$). The ratings appear to be related to CA and MA in the former group ($p = .01$) but not in the latter group. Further studies of the efforts of a distracting stimulus and correlations with other behavioral signs of brain damage are indicated.

Sievers, D. J., and Rosenberg, C. M.: The differential language facility test and electroencephalograms of brain injured mentally retarded children, *Amer. J. Ment. Defic.*, *65*:46–50, 1960. The EEG tracings of 50 brain-injured mentally retarded children (CA 12; MA 4; IQ 36) were grouped into four categories: (1) grand mal, (2) grand mal and petit mal, (3) hypothalamic, and (4) slowing. The scores of the four groups on the Differential Language Facility Test were compared. There were significant differences among groups on the two tests that involved the audio-vocal on the integrational and grammatical levels. The grand mal mixed with the petit mal group was significantly lower than the slowing group on both tests. On one subtest, the slowing group was also significantly higher than the hypothalamic group. On the other subtest, the grand mal mixed with petit mal group also had a significantly poorer performance than the hypothalamic group. The grand mal pure group and the slowing group were significantly different.

Sleeper, M. D.: "Correlation of Body Balance and Space Perception in Cerebral Palsied Individuals." Master's thesis, University of Southern California, 1962. Thirty-eight cerebral-palsied individuals (CA 10–43) received (1) the Ayres Space Perception Test, (2) a test of perception of verticality, and (3) a test of body balance. The Ayres test correlated with perception of the vertical ($r = .47$, $p = .01$). Neither of these measures correlated with a test of body balance.

Solomons, H. C.: "A Developmental Study of Tactual Perception in Normal and Brain Damaged Children." Doctoral (education) dissertation, Boston University, 1957. One hundred and sixty normal children (IQ 108, CA 5–9) were compared with 49 brain-injured children, of whom 19 had motor involvement (IQ 96) and 30 were free of any physical handicap (IQ 100). Test stimuli were varied by size, weight, texture, and form. In normal subjects there was a steady decline in errors with increasing age, except for the nine-year level. Normal subjects exceeded the nonhandicapped brain-injured group, which, in turn, exceeded the handicapped brain-injured group. The weight test did not discriminate between the groups and was the least reliable of the measures.

Spivack, G., and Levine, M.: The spiral aftereffect and reversible figures as measures of brain damage and memory, *J. Personality*, *25*:767–778, 1957. Thirty-two brain-damaged boys (CA 11–21) were compared with 35 emotionally disturbed boys (CA 11–19) with primarily neurotic and characterological diagnoses. The emotionally disturbed boys perceived the spiral aftereffect more often and for a shorter duration. They also showed more rapid reversals on reversible figure tasks, reversible faces, and the Necker Cube. On recall of a memory paragraph, they were also superior on both immediate and delay. On the whole, although the significant differences appear, discriminating power of the spiral aftereffect is lower than other reports in the literature have indicated. Furthermore, there appears little relationship among the aftereffect, reversible figures, and memory.

Stephenson, G. R.: "Form Perception, Abstract Thinking and Intelligence Test Validity in Cerebral Palsy." Doctoral dissertation, Teachers College, Columbia University, 1957. Thirty-six cerebral-palsied children, 20 of whom were retarded and 16 nonretarded (CA 5–18), were matched for age and educational achievement as rated by teachers. The group received a test battery of two language tests—the Ammons Full Range Vocabulary Test and the Non-Vocal Scale of Mental Functioning (constructed specially for this research) —and two nonlanguage tests involving the perception of visual form—the Columbia Mental Maturity Scale and the Raven Progressive Matrices. Over-all performances were the same for both groups. The cerebral-palsied group was significantly inferior in nonlanguage tasks ($p = .001$), although the groups were equal when items were subdivided into concrete and abstract for both language and nonlanguage tasks. Inferior form perception in cerebral-palsied children confirms previous findings. The negative findings with regard to the abstract-concrete dichotomy contradict previous research.

St. Hilaire, T. F.: A study of abstract thinking in cerebral palsied children, *The Bulletin, Georgetown University Medical Center,* 2:206–220, 1957. A review of the literature on the mental evaluation of cerebral-palsied children since the work of Sachs in 1926 is presented. The work of Lord, Doll, Gesell, Phelps, McIntire, Myer and Simmel, and Sarason and Sarason form the background for this study. 73 cerebral-palsied children under treatment at the Washington, D.C., Society for Crippled Children received the Stanford-Binet. The children averaged 6.4 years of age (3–14), with an average mental age of 4.5 (2–12). They were subdivided into seven groups on the basis of medical diagnoses. 43 also received the Merrill Palmer. All the items on both of these scales were rescored by two judges on a four-point scale of abstract–not abstract, as defined by Goldstein and Scheerer. Although 30 of the 73 children had IQ's below 70, many children were able to make plus scores on items that were rated as abstract and were above their mental age. Cerebral-palsied children did better in abstract thinking than equated groups of familial defectives. Differences between types of cerebral palsy on the various measures are discussed.

Strauss, A. A.: Ways of thinking in brain-crippled deficient children, *Amer. J. Psychiat., 100*:639–647, 1944. Brain-injured children relate ideas on the basis of unusual or nonessential details. Their most serious thinking handicap is in the function of selectivity, or the inability to discriminate the essential from the nonessential. The ability to pursue a goal is impaired because of this. Such children may recognize reality very well and stick closely, even meticulously, to the facts but, because of their specific disorders, they may actually evade the proper solution of a problem or escape into fantasy.

Strauss, A. A., and Kephart, N. C.: Behavior differences in mentally retarded children measured by a new behavior rating scale, *Amer. J. Psychiat., 97*:1117–1123, 1940. A comparison of 40 familial with 40 brain-injured mentally retarded children (CA 16, IQ 60) on a behavior rating scale filled out by teachers showed that the brain-injured group was more impulsive, erratic, restless, furious, daydreaming, and socially unacceptable. No evidence of cross-validation is presented.

Strauss, A. A., and Kephart, N. C.: *Psychopathology and Education of the Brain Injured Child: Vol. II. Progress in Clinic and Theory.* Grune & Stratton, 1955. This book is an attempt to present newer views on brain functioning since publication of the original Strauss and Lehtinen volume in 1947. It is concerned with the child of normal IQ. Theories of brain function stressing concepts such as servomechanisms, homeostasis, and scanning functions are emphasized. The relationship of embryology to brain injury is explored. In describing the psychopathology of perception, language, concept formation, and behavior, theories of normal development in these areas are sketched. Essays on testing the brain-injured child, including a description of various aspects of mental functioning and how they can be measured by the marble board and the Ellis Design Test, are presented along with a discussion of educational principles and practices.

Strauss, A. A., and Lehtinen, L.: *Psychopathology and Education of the Brain Injured Child.* Grune & Stratton, 1947. This classic has undergone 10 reprintings since its initial publication. It is based on a series of researches and influenced by Gestalt psychologists, particularly the work of Goldstein on brain-injured soldiers after World War I, and attempts to delineate disturbances in the brain-injured retarded child. Although defects of the neuromotor system may be present or absent, disturbances in perception, thinking, and emotional behavior—singly or in combination—are characteristic. These disturbances can be demonstrated by specific tests, which are described. The findings lend support for distinguishing between the exogenous and the endogenous retarded child, although the studies carried out at the Wayne County Training School are not confined to the retarded. The second half presents the general principles in the education of the brain-injured child, including teaching arithmetic, reading, and writing. Modifications of classroom procedures to reduce hyperactivity are suggested.

Strauss, A. A., and Werner, H.: Disorders of conceptual thinking in the brain-injured child, *J. Nerv. Ment. Dis., 96*:153–172, 1942. The materials used in these studies consist of two sorting tasks and a picture object test. In grouping objects, brain-injured children formed more groups than non-brain-injured children. They also used more uncommon responses and more singular or unique combinations. Selection tended to be on the basis of unspecific or vaguely conceived qualities, unessential or accidental details or functional relationships, or *ad hoc* constructions. In the picture object test, which involves the relationship between life situations as represented in pictures and small objects, brain-injured children used more objects. They deviated from the standard meaning of these objects. They organized objects in circumscribed, small units with conspicuous formalistic and oversystematic arrangements. Whereas the non-brain-injured child saw this task as a problem of grouping, the brain-injured child saw it as a concrete, alive situation with a past and a future, stressing the dynamic, functional properties of the objects. In the discussion, observations are made about the forced responsiveness to stimuli, the pathological fixation, the motor disinhibition, and the dissociation (*i.e.*, incoherence in patterned behavior). The clinical descriptions and interpretations are extremely rich.

Strauss, A. A., and Werner, H.: Experimental analyses of the clinical symptom "perseveration" in mentally retarded children, *Amer. J. Ment. Defic., 47*:185–192, 1942. Twenty endogenous children who were matched with 20 exogenous retarded children on MA and IQ were presented with two tasks: reproducing tone rhythms and recognizing drawings of objects upon brief tachistoscopic exposure. The groups did not differ in immediate or single perseverations (*i.e.*, repetition of a response that immediately preceded the wrong one); however, the exogenous group showed more repetitive perseveration (*i.e.*, repeating the wrong response several times) and delayed perseveration (*i.e.*, repeating a response that had been presented two or more trials earlier). Exogenous children also continued to perseverate even when strikingly different test objects were presented.

Strauss, A. A., and Werner, H.: Comparative psychopathology of the brain-injured and the traumatic brain-injured adult, *Amer. J. Psychiat., 99*:835–840, 1943. Characteristics of the behavior of brain-injured children and the experiments that elicit them are described. Among the characteristics are (1) forced responsiveness to stimuli, (2) fixation and perseveration, (3) instability or fluctuation, (4) meticulousness and pedantry, and (5) substitute activity, a term that describes the response of the brain-injured child who constructs a figure on the marble-board test not by immediate perception but by counting the holes. Most of these behaviors and experimental situations have been described in other studies in this series.

Sugar, O.: Congenital aphasia: an anatomical and physiological approach, *J. Speech Hearing Dis., 17*:301–304, 1952. Because it is possible to remove one hemisphere in children without inducing aphasia, one must postulate that both hemispheres are implicated in aphasic children. The term should refer to disability in speech in children intellectually and physically capable of talking. As it occurs in adults, aphasia implies a loss of a learned function; this type does not affect children permanently and could not be said to occur as a congenital condition.

Taterka, J., and Katz, J.: Study of correlations between electroencephalographic and psychological patterns in emotionally disturbed children, *Psychosom. Med., 17*: 62–73, 1955. The Rorschach, Bender Gestalt, Figure Drawings, and EEG were administered to 195 children suffering from schizophrenia or primary behavior disorder

(CA 5–12) and a control group consisting of 44 children matched for age and sex and free of emotional disturbance. Conclusions: (1) 78 percent abnormal EEG in childhood schizophrenia suggests an organic component. 73 percent abnormal EEG in the primary behavior group also suggests a cerebral defect or lag; (2) the EEG is not related to specific traits; (3) the more abnormal the EEG, the greater the problems in perception; (4) gross distortions in visual-motor gestalten appear related to foci and asymmetrics in the EEG, mostly in the occipital area; (5) alpha percentage is related to accuracy of form perception on the Rorschach; and (6) results support Schilder's theory that organic damage to the brain causes perceptual and motor disturbance.

Taylor, Edith M.: *Psychological Appraisal of Children with Cerebral Defects.* Harvard University Press, 1959. On the basis of many years of clinical experience, Dr. Taylor outlines a number of portraits of children with different types of central nervous system damage at different ages. She describes the testing techniques and their clinical implications in detail. Follow-up data on 244 cerebral-palsied children 3 to 12 years after the initial evaluation shows that intelligence remained the same in 73 percent of the cases. Disagreement tended to be related to delayed language development, hearing problems, or precocious verbal fluency. Detailed test protocols are presented. The influence of Gesell and Piaget are freely acknowledged.

Teuber, H. L., and Rudel, R. G.: Behavior after cerebral lesions in children and adults, *Devel. Med. Child Neurol.*, *4*:3–20, 1962. Review of animal experiments suggests that brain injuries sustained early in life have less effect than comparable lesions incurred at later ages. In contrast, neurological observations suggest that certain forms of early brain damage in children may have disproportionately serious consequences for later life. The apparent contradiction may be resolved if one grants that results might differ according to (1) the kind of task involved and (2) the age at which the child is tested. These perceptual tasks have been devised to show such differential effects. On one task (constant error in auditory localization with the body tilted), the performance of brain-damaged children was essentially the same as that of normal children until age 11, but it became increasingly different thereafter. On the second task (starting position error in the same test), brain-damaged children did consistently worse than controls at all ages. On the third task (self-righting in a tilted chair until the vertical position is reached) brain-injured children did less well than controls until the age of 11. After this, differences washed out. The brain-injured children ($N = 72$) used in this study were cerebral palsied. Actuarial characteristics are reported elsewhere.

Thelander, H. E., Phelps, J. K., and Kisk, E. W.: Learning disabilities associated with lesser brain damage, *J. Pediat.*, *53*: 405–409, 1958. Any interference with the integrity of the central nervous system may give rise to deviations in intellectual development. The most easily recognized are speech and hearing problems, usually detected when a child enters school. More subtle defects are in the areas of expressive speech, understanding oral commands, writing, hearing, control of hyperactivity, and emotional control. Emotional and social maladjustment may result if defects are not recognized and managed. Five case histories are presented.

Tizard, J. P., Paine, R. S., and Crothers, B.: Disturbances of sensation in children with hemiplegia, *J.A.M.A.*, *155*:628–632, 1954. This is a report on 106 patients with hemiplegia. The possible presence of impaired sensation in the affected arm is significant when considering physical therapy and orthopedic surgery. Impairments included most frequently are total or partial ostereognosis or diminished two-point discrimination.

Tolman, N. G., and Johnson, A. P.: Need for achievement as related to brain injury in mentally retarded children, *Amer. J. Ment. Defic.*, *62*:692–697, 1958. "Organic" children appear less able to compete than familials. They are relatively more accepting of rejections by their parents. Intense frustration of a need over long duration impairs need for achievement rather than enhances it, a common finding following brief experimental frustration. Observed differences between groups appears to be more a function of parental management than etiology.

Toman, J. E. P.: Physiological triggering mechanisms in childhood epilepsy, *Amer. J. Orthopsychiat.*, *32*:507–514, 1962. What causes seizures? They cannot occur in a normal brain without the prerequisite of some prior pathological substratum of an organic type. Where such a pathological foundation exists, the relatively normal aggregations of nerve impulses, as well as variations in the cerebral internal environment within normal physiological limits, may act as habitual triggering mechanisms in seizures. The concept of the normally triggered focus of pathology implies a high degree of specialization of function in brain areas, including the anatomical substratum of conditioned reflexes. It is well recognized that prodromata and various types of minor seizures may have a high degree of localizing value for the diagnostician. There has, however, been little exploration of the diagnostic value of data on triggering mechanisms. Sufficient knowledge of such mechanisms in any particular patient may suggest psychotherapeutic maneuvers to help avoid the triggering circumstances. Drugs and psychotherapy help.

Torok, N., and Perlstein, M. A.: Vestibular findings in cerebral palsy, *Amer. Otol. Rhinol. Laryngol.*, *71*:51–67, 1962. Vestibular function was tested in 403 cerebral-palsied children and in 115 children with various other neurologic conditions. Possible spontaneous vestibular manifestations, such as spontaneous nystagmus, and vestibular stimulation by rotation and by 10 cc. water at 20° C. were observed. Hyposensitivity, partial or total, and hypersensitivity were the vestibular abnormalities noted most often. Hypersensitivity was most common in hemiplegic children. Hearing and vestibular abnormalities were much greater in athetoid than in spastic children. Hearing losses were more common than vestibular abnormalities in cases of Rh incompatibility. In cases of neonatal jaundice other than those associated with Rh incompatibility, vestibular abnormalities were twice as common as hearing losses. Abnormal vestibular function was present in 45 of the 73 deaf or severely hard-of-hearing children.

Weatherwax, J., and Benoit, E. P.: "Concrete and Abstract Thinking in Organic and Non-organic Mentally Retarded Children," in *Readings on the Exceptional Child,* by E. P. Trapp and P. Himelstein. Appleton-Century-Crofts, 1962. (Also *Amer. J. Ment. Defic.*, *62*:548–553, 1957.) The assumptions of Strauss that there is a difference between organic and nonorganic children in thinking, and that the organic fails a task because he thinks concretely rather than because he fails to verbalize his thinking processes, are questioned. 25 children with visible neurological impairment (CA 13, IQ 50) were matched with 25 controls. Each subject was shown 12 pictures (comprising four categories of three items each) separately and then asked to recall the pictures as a whole. An index of clustering, *i.e.*, succession of two words in the same category, was taken as the measure of associative grouping or level of abstract thinking. Results showed that both groups could think abstractly to the same degree. By subdividing both groups into two on the basis of training on a similar task, it was possible to demonstrate that the factor of verbal habit training, rather than organicity, is crucial.

Werner, H.: Abnormal and subnormal rigidity, *J. Abnorm. Soc. Psychol.*, *41*: 15–24, 1946. Is rigidity a uniform trait, or are there different kinds of rigidity varying in quality with particular organismic conditions? Non-brain-injured, retarded children may be rigid because of lack of differentiation, whereas brain-injured children may be rigid because of disintegration, incoherence, etc. A series of experiments provides evidence for the different types of rigidity. These include (1) reproduction of tone rhythms, (2) apprehension of tachistoscopic pictures, (3) reproduction of briefly exposed dot patterns, and (4) reproduction of words. Brain-injured children show different patterns of rigidity. The repetitive and delayed forms of perseveration which they demonstrate are probably the result of involuntary isolation of certain elements of the task. These isolated elements may become self-contained and detached from the continuity of the series to such an extent that they may be repeated over and over again or jump suddenly into prominence in spite of the incongruity of such behavior.

Werner, H., and Bowers, M.: Auditory motor organization in two clinical types of mentally deficient children, *J. Gen. Psychol.*, *59*:85–99, 1941. Twenty-five endogenous retardates and 26 exogenous retardates were tested on their ability to reproduce 17 melodic patterns. The endogenous responded as normal children. Their errors may be seen as a retrogression to a simpler, more primitive organization. Errors of the exogenous type are generally uncommon in normal development, with incoherence rather than globality. These characteristics correspond to previous findings in the visuo-motor area. The findings may, therefore, be presumed to cut across sense modalities.

Werner, H., and Carrison, D.: Animistic thinking in brain-injured mentally retarded children, *J. Abnorm. Soc. Psychol.*, *39*:43–62, 1944. Eighteen pairs of retarded children, differing in regard to the presence or absence of brain damage, were matched on MA and IQ. In one experiment, when asked whether inanimate objects, natural events, plants, and animals were living or dead, the brain-injured group referred to a larger range of objects as living than the non-brain-injured group. In a second experiment, brain-injured children attributed capability of feeling, knowing, being mean, etc. to a larger number of objects than the controls, corroborating the results of the first study. Animistic thinking is due to an inability to separate living from nonliving objects. In normal development, egocentrism of the young child, who sees the world as being entirely like himself, is the course of animistic thinking. To the brain-injured child, who is influenced by external stimuli to an inordinate degree, the difference between the outside world and the self must be of less import.

Werner, H., and Strauss, A. A.: Causal factors in low test performance, *Amer. J. Ment. Defic.*, *45*:213–218, 1940. On the marble-board and similar tests, mentally deficient children of the exogenous type responded in an incoherent, discontinuous manner. A second type of marble-board test, in which the holes formed a definitely structured background, showed that interference of the background was actually a condition for incoherent organization. Marble-board and tachistoscopic tests (9 cards having black and white drawings of objects, *e.g.*, hat, cup, bottle, etc. embedded in clearly structured homogenous backgrounds consisting of jagged or wavy lines were shown for ⅕ second and each child was asked to tell what he saw) demonstrated an impairment of primitive perceptive functioning—the differentiation of figure from ground—in exogenous children.

Werner, H., and Strauss, A. A.: Pathology of figure ground relation in the child, *J. Abnorm. Soc. Psychol.*, *36*:58–67, 1941. Three groups of children were studied: normals ($N = 30$, CA 7–10), endogenous ($N = 25$; MA 11; IQ 60–90), and exogenous ($N = 25$; MA 8–12; IQ 55–95). They were first presented with cards with black and white drawings of common objects embedded in clearly structured backgrounds consisting of jagged lines, etc. The brain-injured children responded more frequently to the background material than to the foreground, in contrast to the other groups. Second, only the two retarded groups were presented with a geometric figure consisting of heavy circular dots embedded in a configuration of smaller dots. The figures were exposed tachistoscopically for half a second and the child was asked to pick out the one most like the test card from among 3 cards. One card contained only the background. The second contained the correct background and the wrong foreground. The third contained the correct foreground and the wrong background. 52 percent of the brain-injured group responded to the second card (background) whereas only 28 percent of the familials did. Third, the two groups were asked to construct patterns on a marble board similar to the one presented by the examiner. The board had background patterns designed to confuse the subject. 84 percent of the brain-injured showed interference from the background and only 15 percent of the familials did. Finally, when two retarded groups were presented with three geometric figures (a square, an oval, and a triangle) in a test of kinesthetic perception, differences occurred. The brain-injured group had difficulty with figures composed of spherical rubber tacks which were placed against a background of flat enamel tacks. These difficulties were less pronounced when the figures were presented in the form of a raised wood solid upon a smooth surface board.

Werner, H., and Thuma, B. D.: Critical flicker frequency in children with brain injury, *Amer. J. Psychol.*, *55*:394–400, 1942. Exogenous retarded children showed lower critical flicker frequency than endogenous retarded children. The difference was greater at the lower brightness levels than at the higher. The results can be explained by the impairment of the normal mechanism of integration and by lesions that interfere with the interaction of regions of the nervous system, leading to the isolation of neural events. This isolation may be due to perseveration or prolonged aftereffect of stimulation as a consequence of the inhibitory action of the cortex on the lower centers. The lower CFF in the exogenous group may be due to a perseveration of the aftereffects of successive flashes, which might be expected to yield fusion at a lower rate of stimulation.

Werner, H., and Thuma, B. D.: A deficiency in the perception of apparent motion in children with brain injury, *Amer. J. Psychol., 55*:58–67, 1942. In this series of four experiments comparing 20 endogenous and 20 exogenous children (CA 12, MA 9) on a series of tasks to determine the child's ability to perceive apparent motion, the following findings resulted: (1) When the time of exposure of two straight-line figures was varied by means of a tachistoscope, the brain-injured children did not see apparent motion of the figure; all but one of the non-brain-injured were able to perceive such motion. (2) When subjects were asked to judge a band of light moving through a sector of a circle, the brain-injured children needed a much slower speed of rotation before the motion itself became obvious, but they were able to perceive real motion. (3) When presented with two alternating figures by the use of a tachistoscope—the first was a stick man standing on one foot and the second was an arrow pointing diagonally upward—most of the endogenous children reported some sort of motion, such as dancing or jumping of the man or angular or linear displacement of the arrow. However, only 17 percent of the brain-injured reported this, indicating that the failure to see movement in the parallel line situation was not due to interference of strong independent movements of the two figures but to the rare occurrence of seeing movement with tachistoscopic exposure. (4) Two figures were presented alternately to the subjects, one a black disk on a white background and the other a black ring on a white background. The figures were placed so as to be concentric when presented simultaneously. Since it took less time for the disk to disappear for the brain-injured than the non-brain-injured group, it was concluded that the interaction of neural effects produced by the two patterns was reduced in the brain-injured child. The studies illustrate Goldstein's principle of the isolation of function following damage to the nervous system.

Werner, H., and Weir, A.: The figure-ground syndrome in the brain-injured child, *Int. Record of Med. Gener. Pract. Clinics, 169*:362–367, 1956. The authors review nine studies of normal and exogenous and endogenous children matched for MA which demonstrate that brain-injured children are much more susceptible to interference from background stimuli than the other groups. Figure-ground disturbances are demonstrated in perception, memory, and conceptual thought. Examples from the different studies are cited to support this. The "figure-ground syndrome does not imply impairment of a unitary function." It is concerned as a "psychobiologically fundamental performance that may be impaired because of a number of disturbing factors." These factors may even appear antagonistic to each other (*e.g.*, rigidity and lability) and yet be manifestations of the same syndrome.

Wood, N. E.: Comparison of right hemiplegics with left hemiplegics in visual perception, *J. Clin. Psychol., 4*:378–380, 1955. Fifty right and 36 left hemiplegics (CA 10–30) were equated for socioeconomic background, race, sex, seizures, and intelligence. They were further subdivided into two groups each of good and poor vision. There were no significant differences between groups on the Werner-Strauss embedded-figure test, the Street perceptual closure test, and the ambiguous face profile test, which was scored for perseveration.

Wood, N. E.: Comparison of right hemiplegics with left hemiplegics in motor skills and intelligence, *Percept. Motor Skills, 9*:103–106, 1959. Twenty-five right and 25 left spastic cerebral-palsied hemiplegics (CA 10–16) were compared on the Wechsler-Bellevue Intelligence Scales and a battery of eight motor tasks. No differences were found between the groups.

Wortis, H. Z., and Margolies, J. A.: Parents of children with cerebral palsy, *Med. Social Work, 4*:110–120, 1955. Reality problems, which include not only the difficulties in the physical care of a severely handicapped child but also the financial, housing, personal, and familial problems, are the major source of personality problems and anxieties in parents of cerebral-palsied children. This is based on a study of parents of 37 children in the special class at Public School 135, New York City.

Zuk, G. H.: Autistic distortions in parents of retarded children, *J. Consult. Psychol.*, *23*:171–176, 1959. A comparison of Vineland Social Maturity Scores, which are based on the parents' observations of the child's behavior, with the intelligence test scores based on actual behavior showed that for two samples of nonhandicapped retarded children ($N = 95$ and 50; CA 1–8; MA 2–9) the Vineland score was higher than the intelligence test score ($p = .001$). However, this discrepancy did not exist for 22 retarded handicapped children, more than half of whom had a diagnosis of cerebral palsy. The tendency of parents of nonhandicapped children to overestimate their children's abilities may be seen by the fact that the discrepancy melted away when teachers were required to fill out the VSMS.

Zuk, G. H.: Clinical differentiation of patterns of distractibility in young retarded children, *J. Clin. Psychol.*, *18*:280–282, 1962. Distractibility was observed in 36 of 133 mental retardates (CA 2–8, MA 1–2). Sex ratio (31 males) was similar to Laufer and Denhoff's description of hyperkinetic behavior syndrome. As in brain-injured children, it was assumed to be due to overattention to moving as opposed to stationary stimuli. Two types may be distinguished: Type I (MA 12–18 mos.) precipitates movement in the environment, *e.g.*, push-pull activities for their own sake, and utilizes gross body parts. Type II (MA 18–24 mos.) shows more investigative motor activity involving refined body parts, *e.g.*, finger more than hand, hand more than shoulder. These are illustrated by case presentations rather than quantitative data. The distinction may be useful in examining the "untestable" child.

Zuk, G. H.: Overattention to moving stimuli as a factor in the distractibility of retarded and brain injured children, *Train. Sch. Bull.*, *59*:150–160, 1963. Distractible behavior in retarded and brain-injured children, often regarded as random or undirected, actually has goal direction and is purposeful. It serves to focus and sustain overattention to moving stimuli, a developmental characteristic common to younger children. Of 133 retarded children seen, 36 proved to be distractible. Two types of distractibility may be distinguished. The notion of overresponsiveness to moving stimuli is in contrast to the Strauss-Lehtinen view of distractibility as an overresponse to an intruding background. Hyperactive children, for example, grow less distractible while riding in a moving automobile or watching a television program. This would appear to contradict the Strauss-Lehtinen theory. According to Zuk's theory, the teacher should mobilize attention by exposing briefly moving stimuli, not by neutralizing the background.

4. ETIOLOGY—CLINICAL, EXPERIMENTAL, EPIDEMIOLOGIC

Adler, E.: Familial cerebral palsy, *Cereb. Palsy Rev.*, *22*:4–7, 1962. (Also in *J. Chronic Dis.*, *13*:207–214, 1961.) Prenatal causes are increasingly being invoked to account for cerebral palsy. Among 120 cases, there were 16 (8 families) with near relatives affected. In 5 of the families, consanguinity of parents was found. Some genetic factor seems to be present in some instances of cerebral palsy. Familial cases tend to have poorer prognosis than nonfamilial.

Apgar, V., Girdany, B. R., McIntosh, R., and Taylor, H. C.: Neonatal anoxia: I. A study of the relation of oxygenation at birth to intellectual development, *Pediatrics*, *15*:653–661, 1955. Capillary blood oxygen content, or saturation, was measured at various intervals in the first three hours after birth. Stanford-Binet test scores were available on 243 randomly selected subjects who were submitted to this procedure. By the second hour, most infants had stabilized at average adult levels of blood oxygen content. No significant correlations were obtained between the blood oxygen content measures and the Stanford-Binet scores. An incidental finding is the meager value of the Gesell developmental rating of adaptive behavior ($N = 65$) obtained at 2 years of age and the Stanford-Binet score obtained at 5 years of age.

Baumann, M. C., Ludwig, F. A., Alexander, R. H., Bergin, T. C., and Rauch, A. E.: *A Five-year Study of Brain Damaged Children,* Springfield Mental Health Center, 1962. This report is a follow-up of 40 children (CA 5–12) who had been previously diagnosed as brain damaged and evaluated on psychologic, physical, psychiatric, and neurologic examinations and on the EEG. Of this group, 19 were available for intensive re-evaluation. Symptom check lists were derived from the original evaluations of the social worker, the psychologist, and the psychiatrist and were matched against later behavior. (The accuracy of the clinic team appears established.) A behavioral symptom inventory designed for parents proved helpful. Although intelligence test results appeared reliable on retest, critical analysis of the Bender Gestalt and Pointwavering (a special test designed for this study) indicated a tendency to integrate conceptual abilities with age. Academic attainments remained a problem, although perceptual functioning improved. Short attention span and inconsistency interfere with schooling. The over-all hypothesis, confirmed in part by the data, is that acute symptomatology decreases with age.

Benaron, H. B. W., Tucker, B. E., Andrews, J. P., Boshes, B., Cohen, J., Fromm, E., and Yacorzynski, G. K.: Effect of anoxia during labor and immediately after birth on the subsequent development of the child, *Amer. J. Obstet. Gynec., 80*:1129–1142, 1960. From a group of 40,000 births in a predominantly Negro neighborhood in Chicago, 43 of the most profoundly anoxic were compared with two control groups, one drawn from siblings and the other from an *n* of 40 divided equally by sex and race. Examinations were carried out 3 to 19 years later. The incidence of retardation was greater in the anoxic group (20%) than in the controls (2%). EEG abnormalities (36%) and infantile habits (63%) persisted in this group. However, most of the children in the anoxic group did not show signs of general dysfunction. Anoxia appears to lower the functioning of a few people sharply rather than impair the functioning of the group as a whole.

Benton, A. H.: Mental development of prematurely born children, *Amer. J. Orthopsychiat., 10*:719–746, 1940. In this critical review of the literature, seventy studies are examined. After presenting the problem and its implications (*e.g.,* if mental retardation ensues, then premature birth should not be induced), the concept, and correlates of prematurity, the author suggests a number of conclusions: (1) Prematurely born children show developmental lag during the first two years. (2) Rate of development is not significantly affected by prematurity. (3) Most studies show that prematures are not inferior to normal children in intelligence. It is unclear, however, whether the evidence of frank mental defect is greater. (4) There is no solid evidence that birth weight is related to intelligence. (5) Although many studies report a higher incidence of "nervous traits" in prematures than in controls, there are no definitive studies on this point.

Byers, R. K., and McLean, W. T.: Etiology and course of certain hemiplegias with aphasia in childhood, *Pediatrics, 29*:376–383, 1962. The histories of 12 children who suffered acquired hemiplegia with aphasia are reviewed. Although in 4 the onset was prolonged, it was usually not sufficiently characteristic to allow diagnosis and treatment prior to the development of the complete syndrome. The dominant hemisphere, as demonstrated by the lesion, did not correspond accurately with handedness. Arteriograms were successful in demonstrating vascular malformation or thrombosis in 6 of 7 children on whom they were attempted. Recovery was followed in 10 children over a period of years. All had regained speech spontaneously and 4 appeared intact, or virtually so. All others showed psychologic and neurologic residue. Psychologic stages during recovery are briefly indicated and a philosophy of conservative therapeutic intervention is suggested.

Campbell, W. A. B., Cheeseman, E. A., and Kilpatrick, A. W.: The effects of neonatal asphyxia on physical and mental development, *Arch. Dis. Child., 25*:351–359, 1950. An examination of all health records at the Royal Maternity Hospital, Belfast (1938), disclosed the presence of 89 "asphyxiated" infants. They were matched with 178 controls. Of this total of 267, 73 percent were ultimately examined. No significant differences were found between the groups on physical measurements (height, weight, and chest measurements), hemoglobin levels, and intelligence (based on Raven's Progressive Matrices). All examinations took place at 8 to 11 years of age. The literature, which generally shows that asphyxia at birth causes later retardation, is critically examined. Most previous studies selected clinical samples on the basis of a deviant behavioral characteristic and looked for asphyxia at birth, in contrast to the present study.

Courville, C. B.: *Contributions to the Study of Cerebral Anoxia.* San Lucas Press, 1950. This book presents the history of cerebral anoxia, its pathogenesis and structural characteristics, its importance in evaluating brain damage in children, and the significance of the circulatory component. Cerebral palsy, epilepsy, and mental retardation are considered. Asphyxia in folklore and legend is also presented.

Courville, C. B.: *Cerebral Palsy: A Brief Introduction to Its History, Etiology, and Pathology, With Some Notes on the Resultant Clinical Syndromes and Their Treatment.* San Lucas Press, 1954. This book, written for the general practitioner, contains essays on the causes, diagnoses, prognoses, and principles of various therapies.

Crothers, B., and Paine, R. S.: *The Natural History of Cerebral Palsy.* Howard University Press, 1959. This book is a report of a reappraisal of a large number (1821) of persons with cerebral palsy who had been known to the Children's Hospital, Boston, between 1930 and 1957. Reexamination of 561 cases who spent a full day at the hospital emphasizes the effect of the disability on growth and development. Growth and development, in turn, may change motor patterns. Failure to recognize this leads to overstandardization of therapy. Overemphasis on physical care may foster docility, not independence. Results of treatment could not be evaluated because of poor records. It does appear, however, that physical treatment improves function in the group with pyramidal damage (spastics) but not in the group with extrapyramidal damage. The pyramidal group showed signs of emotional disturbance, the extrapyramidal group did not. Parents and adolescents have been neglected. Children should be encouraged to experiment. On the basis of retrospective data, comments about the classification, etiology and pathology, seizures, intelligence, employability, education, treatment, and family attitudes are offered. Motion pictures of earlier performance helped in the retrospective analysis of a number of cases.

Deaver, G. G.: Etiological factors in cerebral palsy, *Bull. N.Y. Acad. Med., 28*:532–536, 1952. One out of every 200 births shows the clinical signs of cerebral palsy. The prenatal causes include heredity, anoxia, maternal infectious disease, maternal metabolic disease, and erythroblastosis fetalis. The natal causes include anoxia, blockage, analgesia, trauma, sudden changes in pressure, prematurity, vitamin K deficiency. Postnatal factors also are listed.

DeHaas, D. J., Quinn, K. V., and Pryles, C. V.: Enforced delay at delivery and its relationship to brain damage and mental deficiency, *Amer. J. Ment. Defic., 65*:610–615, 1961. Results of a questionnaire survey of 83 institutions caring for mental retardates are presented. The questionnaire dealt with the effect of artificial delay during the second stage of labor. Of 64 (73%) replying institutions, 50 could offer no data, 5 positively stated that they had no children in their institutions with a history of holding back at delivery, and 9 reported that of a total of 130 children, 78 were thought by the staff members to be retarded because of brain damage sustained during enforced delay at the time of delivery. Although limitations of a retrospective survey are acknowledged, "the data suggest a causal relationship may exist between artificial delay and brain damage with mental deficiency."

Denhoff, E., and Holden, R.: Significance of delayed development in the diagnosis of cerebral palsied, *J. Pediat., 38*:452–456, 1951. "(1) The developmental histories of 100 cerebral palsied children were analyzed. Of the developmental items investigated, important deviations from normal were found in a majority of cases as early as three months of age. Deviations continued to be large in a majority of the cases until three years of age. (2) A chart which portrays normal, late normal, and abnormal stages of achieving developmental maturity has been found helpful in the early diagnosis of cerebral palsy. (3) A possible correlation between age of onset in speaking two- or three-word sentences and intellectual function is suggested by the data."

Denhoff, E., and Holden, R. H.: Etiology of cerebral palsy: an experimental approach, *Amer. J. Obstet. Gynec.*, *70*:274–281, 1955. A study of possible causative factors in cerebral palsy was made with 15 children who had "suspicious" findings of brain damage at birth and neonatally as evidenced by obstetrical or neonatal difficulties, *e.g.*, prematurity, hypertonicity, oxygen deficiency, etc. They were matched with 17 healthy baby controls drawn from a random sample of 504 consecutive births in the same hospital. Matching factors were age, sex, and parents' socioeconomic status. Only 4 (27%) of the "suspicious" group had abnormalities in physical, psychological, and/or social development when studied 2½ years later. Three (18%) of the control group had similar findings. The only factor common to the deviant children in both groups was a history of previous abortions in the mother. Investigations of reproductive physiology would, therefore, be helpful in uncovering the etiology of cerebral palsy.

Denhoff, E., Holden, R. H., and Silver, M. L.: Prognostic studies in children with cerebral palsy, *J.A.M.A.*, *161*:781–784, 1956. A sample of 50 cerebral-palsied children (CA 3½, IQ 60) was studied. Psychological tests and pneumoencephalograms to predict a child's progress as judged by a pediatrician over a two-year period were administered. There was 81 percent agreement between test predictions and clinical progress and 72 percent agreement between pneumoencephalogram and clinical progress. Prognosis is "good" for children in the normal or unilateral cerebral atrophy pneumoencephalogram classification if intelligence is borderline normal or better, whereas outcome seems "poor" for children in the bilateral cerebral atrophy and unilateral cortical atrophy classifications. Prognosis is guarded and depends on intellectual potential in the remaining categories. It would seem that those who will make adequate adjustments in later life are children with spastic hemiplegia, with unilateral brain damage and dull normal intelligence or better, or with a mild handicap of any category and a relatively good pneumoencephalogram and good IQ. The child with spastic quadriplegia with bilateral brain damage and mental deficiency appears destined for home or custodial care.

Drillen, L. M.: A longitudinal study of the growth and development of prematurely and maturely born children: Part VII. Mental development, 2–5 years, *Arch. Dis. Child.*, *36*:233–240, 1961. In a study of more than 500 singletons and twins of different birth weight in Edinburgh, intelligence test scores at 3, 4, and 5 years were correlated with birth weight. Twins showed consistently lower scores than singletons of like birth weight at 4 and 5 years. There was a striking excess in the smaller premature group (*i.e.*, 4½ lb. or less) of children who are ineducable in normal school or will need special educational treatment within normal school. Mental development was related to the apparent intelligence of the mother and to the type of home. Differences between social classes appeared to be greater between 4 and 5 years than at 2 years. In average and poor working-class homes there was little difference in mental ability between those prematures who were over 4½ lb. at birth and mature controls. In superior working-class and middle-class homes, the child between 4½ and 5½ lb. at birth was still at a disadvantage. Predictive value of early developmental testing is discussed. Response to preschool developmental tests is affected by birth weight, environment, and opportunity. Early developmental testing is of most value in the detection of children who later prove to be dull, retarded, or defective. (Previous studies in this series: *Arch. Dis. Child.*, *33*:417, 1958; *34*:37, 1959.)

Ernhart, C. A., Graham, F. K., and Thurston, D. L.: The relationship of perinatal anoxia to intelligence and to neurological deviations in the preschool child, *Amer. Psychol.*, *13*:324, 1958. In a comparison of a group of 76 children who had histories of anoxia at birth (48 mild and 28 moderate-severe) with a control group ($N = 88$) equated for sex, race, and socioeconomic status, the anoxic children did less well on the Stanford-Binet (IQ 95) than the controls (IQ 102). Anoxic children also did less well on a specially devised vocabulary test and neurological examination (anoxic = 17% normal, controls = 58% normal). These findings indicate an association between anoxia and deficit but not necessarily a causal relationship.

Freedman, A. M., Braine, M., Heimer, C. B., Kowlessar, M., O'Connor, W. J., Wortis, H., and Goodman, B.: The influence of hyperbilirubinemia on the early development of the premature, *Psychiatric Research Reports,* No. 13, pp. 108–123, 1960. Following a review of the literature, it is hypothesized that increasing amounts of bilirubin in the bloodstream of prematures are associated with increasing manifestations of cerebral injury. Correlating bilirubin levels at birth with developmental data obtained at one year, it was found that such a relationship exists for both the Gesell Gross Motor Schedules and the Cattell Infant Scales for males but not for females. Females ($N = 94$, low social class Negroes) exceeded males ($N = 68$, low social class Negroes) on both the Gesell and the Cattell, suggesting the greater vulnerability of males to the effects of prematurity. The findings confirm those previously reported on data obtained at four months of age (A. M. Freedman *et al.:* "The Effect of Neonatal Hyperbilirubinemia on the Premature Infant," in *IX International Congress of Pediatrics,* Montreal, 1959).

Goldstein, R.: Hearing and speech in follow-up of left hemispherectomy, *J. Speech Hearing Dis., 26*:126–128, 1961. Speech and hearing in a 42-year-old man who had undergone hemispherectomy for right infantile hemiplegia were normal 5 years later.

Goldstein, R., Goodman, A. C., and King, R. B.: Hearing and speech in infantile hemiplegia before and after left hemispherectomy, *Neurology, 6*:869–875, 1956. Four adults who had right infantile cerebral palsy received auditory tests before and after left cerebral hemispherectomy. Although auditory thresholds were normal for both ears preoperatively, there was difficulty in identifying 45 percent of the words presented to the right ear at intensities above normal thresholds. This pattern remained the same following removal of the abnormal hemisphere. Speech was not affected by the surgery. The findings are interpreted to confirm a previous hypothesis that abnormal activity in the pathologic hemisphere may disrupt the intact one.

Graham, F. K.: A longitudinal study of the effects of perinatal anoxia, *Amer. Psychol., 13*:334, 1958. This is a preliminary report of a re-examination of 3-year-olds ($N =$ approximately 400) who were seen at birth. Half had been exposed to cerebral anoxia or other trauma at birth. Half served as controls. Re-examination showed controls to be superior on personality traits. Only a handful of children showed gross motor defects. A general inferiority of the anoxic children as a whole rather than a few extreme cases seems to account for small group differences.

Graham, F. K., Matarazzo, R., and Caldwell, B.: Behavioral differences between normal and traumatized newborns, *Psychol. Monogr., 70*: Nos. 20 and 21, 1956. In the first monograph, five test procedures capable of differentiating normal newborns from those who have been traumatized and possibly brain injured are described. The tests consist of a pain threshold test, a maturation test, a vision scale, an irritability rating, and a muscle tension rating. The second monograph describes how they were administered to 265 infants who had a normal birth and 81 who had a traumatic birth at the St. Louis Maternity Hospital during a two-year period. Reliability data appear to be satisfactory. Norms for each test, with separate norms for each of the first five days of life and for social factors, are included. Normal and traumatized groups differed on all tests. When a cut-off point at the poorer end of the normal distribution was selected, all tests identified some traumatized infants as abnormal, whereas false positives ranged only from 1 to 3 percent. The percentage identified as abnormal increased with the seriousness of the traumas rated by pediatric judges. The problem of making predictions from test results is discussed.

Greenbaum, J. V., and Lurie, L. A.: Encephalitis as a causative factor in behavior disorders of children, *J.A.M.A., 136*:923–930, 1948. This is the third report (*Ohio Med. J., 41*:1018, 1945; *Amer. J. Psychiat., 104*:71, 1947) of 78 children who presented behavior disturbances following an attack of encephalitis. The group represents 3 percent of the children admitted to a child guidance home over a 28-year period. It is a follow-up four to ten years later. In 60 of the cases, onset was below age 10. The younger the patient at the time of illness, the greater the psychiatric disability. Behavioral changes were noted soon after the attack. Behavior patterns could be grouped into (1) simple disturbances, (2) psychopathic behavior, and (3) psychotic behavior. At intake, intelligence was normal or better in 57 cases. On retest, it remained the same in 9 cases, improved in 1 case, and deteriorated in 37 cases. Neurological abnormalities were noted in 56 cases. 61 children had a uniform personality pattern marked by impulsiveness, distractibility, etc. Only 12 had made a fair social adjustment. Prognosis is poor. The classic psychobiologic approach, which relates structure to function, is urged.

Greenspan, L., and Deaver, G. G.: Clinical approaches to the etiology of cerebral palsy, *Arch. Phys. Med. Rehab.*, *34*:478–485, 1953. A complete history including obstetrical data was obtained from 100 mothers of children attending a preschool cerebral palsy clinic in New York City. Each attending obstetrician and hospital was required to fill out retrospective forms pertaining to natal events. The responses from the 94 who complied led to the following conclusions: Age of mother at child's birth, the fact of the child's being the first born, and his birth weight do not play any role. Prematurity, multiple pregnancies associated with prematurity, prenatal anoxia (15%), and Rh (7%) seem to be potent factors. For the most part, it is difficult to point to a single etiologic factor as the "cause" in most cases.

Harper, P. A., Fischer, L. K., and Rider, R. V.: Neurological and intellectual status of prematures at three to five years of age, *J. Pediat.*, *55*:679–690, 1959. 460 prematurely born children were examined at ages 3 to 5 years and were compared with 440 full-term controls. Findings were related to similar data gathered at 40 weeks of age. In both examinations, the premature group were less intelligent and gave more signs of neurological disturbance. The prematures were subdivided by birth weight; those who weighed more than 2000 grams were impaired. A comparison of the data with those gathered at 40 weeks of age showed that a child's prognosis for improving or maintaining an average or better rating increased as birth weight increased. Although the premature group performed less well than the full-term group, the great majority of prematures fell within the normal range of intelligence. (This paper is part of a series of studies carried out in Baltimore by H. Knobloch *et al.*, *J.A.M.A.*, *161*:581–587, 1956.)

Hawke, W. A.: Current etiological concepts of cerebral palsy, *Cereb. Palsy Rev.*, *22*:7–9, 1961. In a survey of 377 records of cerebral palsied studied in Toronto, Canada, 10 percent showed a postnatal origin. The syndromes of postconvulsive pareses and kernicterus, as well as their frequency, etiology, and treatment, are described.

Johnson, E. M.: A study of psychological findings of one hundred children recovering from purulent meningitis, *J. Clin. Psychol.*, *16*:55–58, 1960. Of a total of 110 patients ranging in age from one month to 12 years who developed purulent meningitis, 10 died within the first week of hospital admission. For the remaining 100 children who survived, the pre-illness mental status was determined and compared with post-recovery status. 4 were not testable after illness because of severe mental and physical retardation. The Vineland Social Maturity Scale was used as the pre-illness measure, and the Cattell Infant Scales and the Stanford-Binet were used at one- and three-month intervals after illness. For the group as a whole, no significant loss in mental status was noted at three months, although impairment was noted at one month (data not cited). However, young children (under 2 years) showed the most significant differences and complications. Study of a limited number of cases suggests that subdural effusion probably has a detrimental effect upon mental status, especially in the very young. Causal organism, number of cells in cerebrospinal fluid, chemotherapy after hospitalization, duration of illness prior to hospitalization, sex, and race are noncontributory factors.

Kawi, A. A., and Pasamanick, B.: Prenatal and paranatal factors in the development of childhood reading disorders, *Monogr. Soc. Res. Child Develop.*, *24*:14, Serial No. 73, 1959. Following an extensive survey of the literature on theories of the origins of fetal abnormalities and theories of the etiology of reading disability, it was hypothesized that there exists an association between maternal and fetal factors and the development of reading disabilities. The hypothesis was confirmed by a study comparing the prenatal and paranatal records of 372 white male children with reading disorders, born in Baltimore to lower-class families between 1935 and 1945, with the records of a similar number of matched controls. The reading disability cases had a significantly larger number of premature cases with more toxemias and bleeding during pregnancy than did the controls. The findings support the more general hypothesis of a "continuum of reproductive casualty with lethal component consisting of abortions, stillbirths, and neonatal deaths and a sublethal component consisting of cerebral palsy, epilepsy, mental deficiency, behavior disorders, and reading disability." An excellent bibliography is included.

Kephart, N. C., and Strauss, A. A.: A clinical factor influencing variations in IQ, *Amer. J. Orthopsychiat., 10*:343–350, 1940. Fifty-one endogenous retardates (CA 11, IQ 67) were found to drop in IQ when they were in the community but to rise after institutionalization. Fifty matched exogenous retardates were found to drop in IQ in the community and to continue this trend after institutionalization. These data, based on a retrospective study of repeated tests, suggest that in some cases where there is a trend toward a falling IQ a modification of this trend may indicate a definitely favorable result. A theory for the differential effects of different etiologies on intellectual growth is offered along the lines that the endogenous group is retarded because of lack of stimulation. Increasing stimulation will, therefore, raise the IQ. This is not the case for the exogenous group.

Kidron, D. P.: The natural history of cerebral palsy: history and neurological analysis of cerebral palsy patients in Israel, *Cereb. Palsy Rev., 22*:13–15, 1962. This survey of the first 100 patients 14 years of age and over details family and obstetrical histories. Various etiological factors are discussed. Spasticity is the most common type of abnormality. Common disturbances noted in cerebral palsy, including mental deficiency, emotional problems, and dysarthria, occur in more than half of the group. Normal school achievement was obtained by only 15 of the patients. Most presented vocational problems at the time.

Knobloch, H., and Pasamanick, B.: Seasonal variations in the births of the mentally deficient, *Amer. J. Public Health, 48*:1201–1208, 1958. A study of admissions to the Columbus (Ohio) State School of mentally defective children, born over a 35-year period, revealed that significantly more had been born in the winter months (Jan., Feb., and March). Decreased food intake in pregnant women during the hot summer months could result in damage to the baby. Hotter summer months were associated with a significant increase in the number of mental defectives born in the winter months in comparison with cooler summer months preceding winter birth. Possibilities of dietary control in prevention of disability are considered. Findings do not invalidate the hypothesis of infection as a cause of prenatal damage to babies.

Knobloch, H., and Pasamanick, B.: The syndrome of minimal cerebral damage in infancy, *J.A.M.A., 70*:1384–1387, 1959. Examination by means of the neuropsychiatric developmental schedule of Gesell and Amatruda of 500 premature and 492 full-term control infants (in Baltimore) at 40 weeks of age indicates that the amount of neurological damage increases as the birth weight of the child decreases. Reports of behavior from the first month to the time of the examination showed a correlation between the degree of abnormality diagnosed at the examination and certain historical material obtained from the mother. Analysis of 46 individual neurological records demonstrated a correlation between the amount of abnormality noted and the clinical diagnosis of neurological status and delineated those patterns most useful in discriminating between normal and damaged infants. Particular emphasis is placed on those symptoms that comprise the syndrome of minimal cerebral damage, which was found in 100 infants. Findings emphasize the importance of the physician's taking a good developmental history and illustrate the theory that there is a continuum of cerebral damage ranging from severe abnormalities to minimal damage.

Knobloch, H., and Pasamanick, B.: The developmental behavioral approach to the neurologic examination in infancy, *Child Develop.*, *33*:181–198, 1960. In this evaluation of deviation from normal neuropsychologic functioning in infancy, several points are stressed: (1) Damage to the brain is usually diffuse and leads to a variety of disabilities. (2) There is a continuum of damage which ranges from minimal to severe, and there is a quantitative difference in the abnormal patterns over this range. (3) There is a close relation between neurologic integrity and maturational level. The diagnosis that is made on the basis of observed abnormal behavior is dependent on the age and maturity of the infant. Development is orderly, so that early deviation can predict future deviation. Data on the reliability and validity (*i.e.*, predictive value) of the Gesell Developmental and Neurologic Examination are presented to indicate that deviant patterns are significant indicators of cerebral involvement. Using a rating scale for degree of deviation, it was found that more of the children found to be abnormal at the 10-month examination showed abnormal behavior during their first month, presented more behavior problems at the time of testing, had more anxious mothers, and had histories of more illnesses than normal children examined at 10 months of age. The abnormalities predict intellectual function, toilet control, and integrative behavior at 3 years of age.

Knobloch, H., Pasamanick, B., Harper, P., and Rider, R.: The effect of prematurity on health and growth, *Amer. J. Public Health*, *49*:1164–1173, 1959. Incidence of illness, physical defects, and subsequent growth patterns in relation to weight at birth were studied in a group of 500 premature and 692 full-term babies comparable in respect to various socioeconomic variables. At 40 weeks of age, premature infants are, in general, lighter and shorter than mature infants and have more physical defects and/or higher incidence of illness. Neurologic status, physical growth, physical defect, and illness seem to be interrelated. Thus, factors responsible for prematurity and cerebral damage have a generalized deleterious effect. Socioeconomic factors that have a role in the production of prematurity, the complications of pregnancy, and the development of neuropsychiatric disability apparently operate in relation to physical disabilities as well.

Laufer, M. W.: Cerebral dysfunction and behavior disorders in adolescents, *Amer. J. Orthopsychiat.*, *32*:501–507, 1962. Abnormal functioning of the central nervous system, associated with a variety of causes, functional and structural, and present before birth or in the first five years of life, may result in behavioral and perceptual distortions and specific learning disabilities. By adolescence these distortions have often become further encrusted with all sorts of emotional difficulties. They appear as a composite of the underlying, organically determined behavior pattern and the special defensive and adaptational mechanisms of the particular adolescent to the people and situations that surround him. Proper diagnosis and treatment call for a manifold approach, including drugs, special educational help, and psychotherapy.

Lilienfeld, A. M., and Pasamanick, B.: The association of maternal and fetal factors with the development of mental deficiency, *Amer. J. Ment. Defic.*, *60*:557–569, 1960. Birth certificates and hospital records of mentally defective children born in Baltimore between 1935 and 1952 showed significantly more abnormalities during pregnancy, delivery, and in the neonatal period than similar records showed for a group of matched controls. Incidence of mental deficiency was related also to increasing birth order and maternal age at birth. The findings are similar to those observed in stillbirths, neonatal deaths, cerebral palsy, epilepsy, and certain behavior disorders in children. It is hypothesized that there is a continuum of reproductive casualty composed of a sublethal component causing cerebral palsy, epilepsy, mental deficiency, etc., and a lethal component causing stillbirth and neonatal death. Specific conditions represent varying degrees of brain damage. Implications for prevention and management are discussed.

Lurie, L. A., and Levy, S.: Personality and behavior disorders of children following pertussis, *J.A.M.A.*, *120*:890–894, 1942. This report is based on a study of 58 children who suffered whooping cough before 2 years of age. They represent 6.8 percent of an unselected group of 500 problem children. 34 showed definite behavioral, intellectual, and personality changes in later life, apparently as a result of neurologic sequelae. These types of behavior problems did not differ from the general problems presented by the larger sample.

Meyer, E., and Crothers, B.: Psychological and physical evaluation of patients with cerebral palsy studied for periods of ten years or more: 1. Psychological evaluation, by Edith Meyer; 2. Physical evaluation with motion pictures, by Bronson Crothers, *Amer. J. Phys. Med.*, *32*:153–158, 1953. The validity of forecasts based on psychological evaluations of 80 patients carried out at Boston's Children's Hospital have proved to be reasonably accurate, although complete data are not cited. A few instances of inaccurate prediction occurred. They had been (1) overpessimistic in early evaluation of extrapyramidal disorders, (2) overoptimistic in estimating recovery in cases of acute infections.

Findings among a large group of patients with acquired hemiplegia and among a smaller mixed group are discussed. Family attitudes, social life of the cerebral palsied, and the attitude of patients toward their handicaps were explored. Dr. Crothers reports general impressions of methods of physical evaluation in some 200 cases. Physiological changes in the patient may, in general, be responsible for failure of a prediction to hold up. Sensory evaluations have not received sufficient consideration.

Norris, A. S.: Prenatal factors in intellectual and emotional development, *J.A.M.A.*, *172*:413–417, 1960. This is a review of recent literature dealing with the pertinence of prenatal environmental factors to mental development. The well-known epidemiological investigations of Pasamanick and his co-workers are quoted, together with the work of Ingalls which is especially concerned with mongolism. The study of Stott in England—little known in this country—on the importance of maternal emotional stress during pregnancy in the causation of mental defect is also reviewed. No attempt is made to evaluate critically the data collected from various sources.

Paine, R. S.: On the treatment of cerebral palsy: the outcome of 177 patients, 74 totally untreated, *Pediatrics*, *24*:606–616, 1962. A comparison was made of 103 cerebral-palsied patients who had undergone physical therapy with or without bracing and orthopedic surgery with 74 untreated patients. The following results were obtained: (1) In patients with spastic hemiparesis, mild cases developed good gaits with or without treatment; treatment resulted in better gait and fewer contractures in moderate and severe cases. (2) Treating the hemiparetic arm did not induce stuttering or fits. (3) Patients with spastic tetraparesis did less well but were helped by physical therapy and functional training. (4) Gait and hand function of extrapyramidal types of cerebral palsy were not influenced by treatment. The types of therapy used were those fashionable between 1950 and 1960. Many specific findings are presented in this retrospective study of case material.

Pasamanick, B., and Knobloch, H.: Brain damage and reproductive casuality, *Amer. J. Orthopsychiat.*, *30*:299–305, 1960. In this survey of 22 papers in a series of studies extending over 15 years, it is suggested that there is a continuum of reproductive insult, partially socioeconomic in cause, resulting in a continuum of reproductive casuality extending from death through varying degrees of neuropsychiatric disability. Thus far, more than 4000 children, mostly in the Baltimore area, have been studied both retrospectively—*i.e.*, through examination of birth records of children with disturbances and their controls, and prospectively—*i.e.*, through repeated examination on Gesell-type scales of children followed from birth on. Preventive programs during the prenatal period would reduce the incidence of brain damage.

Russel, E. M.: Cerebral palsied twins, *Arch. Dis. Child.*, *36*:328–336, 1961. Forty-four pairs of twins in which one member of each pair suffered from cerebral palsy were matched with 44 control twin pairs without cerebral palsy in Edinburgh. The incidence of twins among cerebral palsy cases is 9 percent. In less than half, the twins of cerebral-palsied patients are surviving and normal. The cerebral-palsied twins differed from control twins in sex distribution (*i.e.*, like-sexed pairs were greater in cerebral palsy group), birth order, weight maturity, pregnancy and parturition, and neonatal course. The incidence of mental impairment, visual, auditory, and speech defects, was higher among the cerebral-palsied twins than among the controls. The most important factor in cerebral-palsied twins appears to be low birth weight due either to multiple pregnancy alone or to a combination of multiple pregnancy and preexisting fetal abnormality.

Schachter, M.: Observations on the prognosis of children born following trauma at birth, *Amer. J. Ment. Defic.*, *54*:456–463, 1950. 353 children who had suffered trauma at birth were compared with 100 normal controls. Developmental data on teething, walking, speech, and toilet training are presented. Alcoholism occurred in nearly one-third of the parents and seemed to be correlated with later, more severe neuropsychiatric disorders. Retardation was present in 47 percent of the cases and neurologic manifestations in 42 percent. Statistics on incidence of seizures, mongolism, encephalopathy, Little's disease, hydrocephalus, speech and visual problems are presented. The study showed that asphyxia does cause some retardation in comparison with a control group. Interpretation of the developmental data must be tempered by the fact that 93 percent of the traumatized group came from "poor homes" (control data not cited).

Thelander, H. E.: Observations on the development of brain damaged children, *Cereb. Palsy Rev.*, *20*:3;8–9, 1959. This is a report of a 6-year follow-up study of children seen between 1952 and 1958 at the Cerebral Palsy Unit of Children's Hospital, San Francisco. Its purpose was to determine the present status and future prognosis of 107 children from the original group of 122. Basic organization of the preschool program for such children is outlined. Much emphasis is placed on work with families of the children. Implications of the study for further research in certain areas are discussed.

Thurston, D. L., Middelkamp, J. N., and Mason, E.: The late effects of lead poisoning, *J. Pediat.*, *47*:413–423, 1955. Eleven cases of lead intoxication were followed for a period of five to ten years. Physical sequelae consisted of blindness and cerebral dysrhythmia. Sodium citrate was the specific therapy in all cases. There was no evidence of mental arrest or deterioration in contrast to previous reports. However, visual-motor problems persisted. These may have placed a child at a disadvantage in primary-grade instruction. As the child matured, there was a gradual loss of hyperactive behavior. There was no correlation between severity of illness and residual effect. Pediatric counseling was helpful.

Wagenheim, L.: The effect of childhood diseases on IQ variability, *J. Consult. Psychol.*, *18*:354, 1954. To substantiate previous findings that early contraction of measles, chicken pox, mumps, or German measles was related to later school achievement, the records of 493 boys were studied. Boys who contracted diseases at very early ages (under 3) were significantly more variable in IQ than those who contracted diseases at a later age. Whether this was caused by encephalomyelitis following childhood diseases or to trauma to the nervous system interfering with the developing ego is hard to say. There appears to be a hierarchy of ages at which diseases are most deleterious. The hierarchy seems to coincide with the emergence of language ideation.

Wortis, H.: The patient with childhood spastic hemiplegia, *Amer. J. Phys. Med.*, *36*:90–94, 1957. Twelve cases of childhood hemiplegia who were followed at a cerebral palsy clinic for more than five years are presented. In each case the presenting problem at the last visit is described. These problems had been in evidence from the patients' early visits to the clinic and were still unresolved. The main need is for vocational, social, and psychological help.

Wortis, H., and Cooper, W.: The life experiences of persons with cerebral palsy, *Amer. J. Phys. Med.*, *36*:328–345, 1957. Life histories of 63 cerebral-palsied persons over 15 years of age who lived in the New York City area were studied. The group was representative of a large clinic population. Major problems were social in nature, *e.g.*, average family income was $46 a week. Two-thirds of the families were disorganized. Medical treatment had been inconsistent, in part because of family disorganization. Inadequate community resources and overly medically oriented social service programs also contributed. Problems increased as the child grew older. Older patients lacked social integration. Hypothesis: The cerebral-palsied person may be generally vulnerable to emotional problems because of his brain injury. The chronically handicapping state further disorganizes family patterns.

Yacorzynski, G. K., and Tucker, B. E.: What price intelligence? *Amer. Psychol.*, *15*:201–204, 1960. A comparison of children who suffered anoxia or precipitate labor at birth with a control group of siblings drawn from 40,000 birth records in Chicago showed that the group with birth trauma were either significantly inferior or significantly superior to the controls. The reasons for this are unknown.

Yue, S. J.: Multiple births in cerebral palsy, *Amer. J. Phys. Med.*, *34*:335–341, 1955. At the Pediatric Cerebral Palsy Clinic of the Columbia-Presbyterian Medical Center, 301 cases, 27 of which were members of sets of twins or triplets, were reviewed. Analysis of data was made in terms of diagnostic classification, duration of gestation, birth weight, birth history, speech evaluation, ophthalmologic complications, and psychometric evaluation. Almost all members of the twins or triplets were of the spastic type.

5. TREATMENT, EDUCATION, AND MANAGEMENT

Anderson, C. M., and Plymate, H. B.: Management of the brain-damaged adolescent, *Amer. J. Orthopsychiat.*, *32*:492–501, 1962. The characteristic symptom picture of minimal, essentially life-long brain damage is presented. A sketch of typical behaviors in childhood, adolescence, and adulthood is presented along with criteria for the presence of "association deficit pathology." These criteria are: (1) Does the history suggest possible etiology? (2) Is perseveration present? (3) Do figure-ground disturbances and a tendency to deal with partials rather than wholes appear? (4) Are there difficulties in unstructured situations? (5) Are there problems in spatial relationships? (6) Is there poor capacity for empathy? Many of these can be detected through clinical observation and psychological tests. The EEG is also useful. Education of parents and teachers, rather than psychotherapy, is the treatment of choice. A new title or diagnostic label is suggested along with the rationale behind it. The article is based on general description rather than specific data.

Barger, W. C.: An experimental approach to aphasic and non-reading children, *Amer. J. Orthopsychiat.*, *23*:158–170, 1953. In this experiment, the mirror technique to improve reading ability and speech of aphasic and nonreading children was helpful, not only in regard to learning but also in regard to emotional status. High incidence of mixed cerebral dominance among children with verbal or reading aphasias seemed significant. Presence of mixed laterality and verticality was less important than the fact that, through intermediations of the mirror, the nonreader made an adjustment to reversals and inversions, often in as few as two lessons. Handedness should be encouraged to correspond to the dominant eye in the child of confused dominance. Psychogenic difficulties are beyond the scope of this paper.

Barger, W. C.: Late reading in children: a review of its origins with a discussion of a correcting device for the aphasic type, *Cereb. Palsy Bull.*, *7*:20–26, 1959. In hard-core reading problems, a physiological element manifested in a tendency to twist symbols (*e.g.*, "b" and "d") was noted in 59 percent of 1000 cases. Techniques for evaluating the deficits that determine laterality are stressed. Tutoring with the assistance of a "Mirroreading Board" is described. This technique has succeeded where others have failed. Special modifications, including an elaborately equipped room, have been found necessary for cerebral-palsied children. About 400 to 500 children have been helped in this way.

Bender, L.: The psychological treatment of the brain damaged child, *Quart. J. Child Behav.*, *3*:323–333, 1951. The largest portion of this article deals with principles and theories in understanding the brain-injured child. Two chief recommendations are (1) to evaluate the total problem and separate the effects of the brain damage from secondary disturbances, and (2) to understand the psychological needs of the child as exemplified in Schilder's work on motility problems. Clinical examples of motility problems are cited, with emphasis on the accompanying anxiety. Therapy should include a warm, mothering relationship with an extended period of dependency. Parent substitutes, sibling equivalents, and organized recreation programs are suggested. Families should be involved in the treatment as early as possible. The drives toward normality should be utilized.

Bryce, T. E.: Suggestions for teaching cooking to the cerebral palsied, *Cereb. Palsy Rev., 23*:15–18, 1962. Safe clothing, appropriate tools and working surfaces, and a plan of work are needed to overcome fear, messiness, slowness, and lack of organization. General techniques of measuring, scraping a bowl, and carrying are offered along with specific cooking procedures.

Clement, M.: Morse Code method of communication for the severely handicapped cerebral palsied child, *Cereb. Palsy Rev.*, 22:5, 1961. This describes a technique for communicating with a severely impaired athetoid girl, 13 years of age. The speech therapist printed the Morse Code on a card and mounted it on the tray of her wheelchair. The girl and her therapist worked out a series of movements—raising her eyes quickly, a smile, and a slight vocal sound—to indicate dot, dash, and the completion of a letter.

Clements, S. D., and Peters, J. E.: Minimal brain dysfunctions in the school age child, *Arch. Gen. Psychiat., 6*:185–197, 1960. A diagnostic plan for detecting minimal brain dysfunctions in children of school age is outlined. This involves careful history-taking, a specialized neurological examination, a rigorously defined psychological evaluation, and an EEG. Omission of any one of these procedures may lead to improper diagnosis and an invalid treatment plan. A treatment plan involving medication, periodic checkups, occasional parental counseling sessions in which an "organic" interpretation of the symptoms is given, and guidance to teachers and principals proves to be an effective approach in a child guidance clinic. The article is typical of more recent approaches to the brain-injured child.

Cruickshank, W. M., Bontzen, F. A., Ratzeburg, F. H., and Tannhauser, M. T.: *A Teaching Method for Brain Injured and Hyperactive Children*. Syracuse University Press, 1961. Forty hyperactive, aggressive children (CA 7–12) were divided into two experimental and two control groups. Five children in each were classified as brain injured and five as learning and behavior disorders without brain injury. Experimental classes had environmental changes to reduce extraneous stimuli and a highly structured program that utilized auditory, kinesthetic, and tactile senses in learning. Thorough testing was done before the study, 10 months later, and again at the end of the next 12 months. Combining the experimental groups for the first retest period, gains were noted in ability to withstand distractions, visual-perceptual performance, and emotional maturity, but not the other variables. At the time of the second retest 12 months later, when the experimental groups had received a year of normal instruction in addition to special instruction, all 40 children had progressed smoothly. It is thought that the study confirms the Strauss-Lehtinen ideology.

Cruickshank, W. M., and Dolphin, J. E.: The educational implications of psychological studies of cerebral palsied children, *Except. Child., 18*:1–8, 1951. Psychological characteristics of cerebral-palsied children are used to show how educational methods and equipment must be adapted for effective teaching. Suggestions are made for the building and equipping of classrooms to eliminate the distracting stimuli of background detail.

Deaver, G. G.: Cerebral palsy: methods of treating the neuromuscular disabilities, *Arch. Phys. Med. Rehab., 37*:363–367, 1956. Various theories of treatment according to Phelps, Fay, Kabat, Pohl, Swartz, and the Bobaths are briefly outlined. A philosophy of treatment in which all but two movements of an extremity are restricted by a prosthetic appliance is found helpful where others fail. The two movements are then used to perform functional activities, including ambulation, hand activities, and bed and wheelchair activities. Various practical techniques to aid in increasing self-care activities are presented, *e.g.*, use of axillary crutches, having a bed at a given height, etc. There is no standard method of predicting which child will benefit from this treatment. Although intelligence is important, it is not always an accurate guide.

Doman, R. J., Spitz, E. B., Zucman, E., Delcato, C. H., and Doman, G.: Children with severe brain injuries: neurological organization in terms of mobility, *J.A.M.A.*, *174*:257–262, 1960. A new system for the treatment of the child with severe brain injury is proposed. It is aimed at the injured central nervous system rather than the resultant peripheral symptoms. A developmental mobility scale describing 13 levels of normal development as the criteria of progress during a two-year study of 76 children was devised. The program (1) permitted the child normal developmental opportunities in areas where the "responsible brain level" was undamaged, (2) imposed externally body patterns of activity which are normally the responsibility of the "damaged brain levels," (3) permitted the establishment of hemispheric dominance and early unilaterality, (4) brought respiratory improvement as measured by vital capacity, and (5) provided sensory stimulation to improve body awareness and position sense. The results of the study are said to indicate the superiority of this method over the traditional ones, with an average gain of 4.2 levels in mobility. Changes in language and affect are suggested. The data and the theory appear promising but await cross validation.

Dudley, J. G., and Lennon, E. J.: Reciprocal innervation in the treatment of respiratory dysfunction, *Cereb. Palsy Rev., 22*:3–4, 1962. A technique for improving respiratory rhythm and depth, by Margaret Rood, emphasizes Sherrington's principle of compensatory reflex stimulation. Utilizing brush strokings and applications of cold, the technique encourages temporary changes in spontaneous respiration as a basis for establishing and retaining more adequate rhythm and control of breathing. Favorable results in clinical work suggest a need for adequate experimental investigation.

Epps, H. O., McCammon, A. B., and Simmons, Q. D.: *Teaching Devices for Children with Impaired Learning: A Study of the Brain-Injured Child from Research Project 50 at the Columbus State School*, ed. R. M. Patterson. The Columbus State School, 1958. A manual for teachers dealing with children who are mentally deficient as a result of brain injury, this booklet represents five years of experience in applying and expanding ideas gained from Dr. Lise Gellner. The three authors, who are teachers, discuss in detail practical teaching methods and materials for educating brain-injured children. Methods are adapted to the particular type of handicap. Children are classified into four major groups according to performance and behavior patterns. Chapters discuss materials for developing sensory perception, discrimination and recognition, techniques for observing and developing motor coordination, class methods for encouraging social perception and emotional development, and the use of constructive tools and musical activity as teaching tools. Ways of teaching number concepts, reading readiness, and writing are also included. A discussion of classroom equipment and sources for obtaining class scheduling, a glossary of terms used in the book, and an index add to the practical value of the book.

Foster, R. E.: A survey of 300 case histories of cerebral palsied patients at Sonoma State Hospital as to their need for continuous care, *Cereb. Palsy Rev., 23*:5–7, 1960. Reviewing 300 out of 800 records of a state hospital in California, the author examined admissions in terms of age and reasons for hospitalization. He concludes that the functionally dependent cerebral-palsied individual may need some agency outside of the family to help with continuous care. There are many different reasons for institutionalization, some of which are determined by the age of the patient. Continuous care planning is important.

Fouracre, M. H., and Thiel, E. A.: Education of children with mental retardation accompanying cerebral palsy, *Amer. J. Ment. Defic., 57*:401–411, 1953. Four recent studies of cerebral-palsied children ($N = 1741$) independently concluded that 75 percent have IQ's below 90. Educational planning must be realistic. Suggestions for countering segregation and its harmful effects are proposed. A school placement system of four levels, which requires a minimum MA of 3 years, is proposed. The scheduling must allow for adequate therapies, which should be worked out with the cooperation of other disciplines. A pre-academic program to nurture readiness for skills is helpful. A diagram of a proposed school progress chart for ages 4 to 16 is offered with suggestions as to promotional policies and content.

Gallagher, J. J.: *The Tutoring of Brain Injured Mentally Retarded Children*. Charles C. Thomas, 1960. Forty-two institutionalized, brain-injured, retarded children (CA 7–13, IQ 33–63) were given individual tutoring during a three-year experimental period. The 21 members of Group E were given two years of tutoring and one year of no tutoring. The 21 members of Group C (individually matched on Binet MA with Group E) received no tutoring for the first two years and tutoring for the final year. Test findings show that, for Group E, there were verbal and nonverbal intelligence gains (4 and 2.4 points respectively) following tutoring but a loss of half the gains when tutoring was removed. Both groups showed improvement in (1) language development (verbal labeling and simple association but not sequential language), (2) copying and memory for designs (rotations were reduced), (3) quantitative skills (writing and recognizing numbers and grouping principles), and (4) Vineland Social Maturity Scale (regression in independent behavior). Gains in one area of abilities are related to gains in other areas. Younger children (8 to 10) profited more than older children (10 to 12). Other variables—particular tutor, length of institutionalization, etiology, medication, number of days tutored—were not related to results. Detailed review of the literature on the tests used, case studies, and implications are included. Tutoring in an institutional setting can offer modest gains, which dissipate when the tutoring ceases. It is suggested that brain injury is secondary, from an educational standpoint, to intellectual behavior patterns.

Gallagher, J. J.: Changes in verbal and non-verbal ability of brain-injured mentally retarded children following removal of stimulation, *Amer. J. Ment. Defic.*, *66*:774–781, 1962. Forty-two brain-injured retardates (CA 7–13, IQ 33–63) were divided in half. Group A received two years of tutoring and two years of no tutoring. Group B received two years of no tutoring, one year of tutoring, and one year of no tutoring. On the Stanford-Binet for Group A, there was a gain of four points which vanished when tutoring was removed, whereas for Group B the tutoring had the effect of halting the downward trend in verbal intelligence commonly observed in institutionalized populations. On the Leiter Scale (a performance test) the gains made under tutoring conditions for Group A were maintained when tutoring was removed; Group B showed no changes following tutoring. It is unclear whether the gains shown resulted from actual improvement of mental functioning or from educational stimulation of a culturally deprived child. Early educational crash programs are urged.

Gottschalk, L. A.: Effects of intensive psychotherapy on epileptic children: report on three cases with idiopathic epilepsy, *Arch. Neurol. Psychiat.*, *70*:361–384, 1953. The seizure frequencies of 3 epileptic children decreased notably during and after psychotherapy. The seizures of 2 of the children had not recurred in two years. The form of the ictal manifestations was modified, as was the frequency of seizure. These findings constitute evidence that psychological as well as other factors can contribute to the form and frequency of seizures and associated clinical manifestations. Evidence is given which supports the hypothesis that interpersonal events, as well as intrapersonal conflicts, can activate epileptic behavior. The detailed account of the treatment is of interest.

Jolles, I.: A teaching sequence for the training of visual and motor perception, *Amer. J. Ment. Defic.*, *63*:252–255, 1958. An actual teaching sequence, developed in the Quincy, Illinois, school system, is presented. It features a progression of pegboard and block designs, with a graduated schedule of the amount of time to be allotted to each unit, based on levels of increasing complexity. Basic objectives for training visual and motor perception are discussed.

Kaliski, L.: Educational therapy for brain-injured retarded children, *Amer. J. Ment. Defic.*, *60*:71–77, 1955. Experience with non-motor-handicapped, brain-injured children (CA 5–14) reveals that perceptual, conceptual, and emotional problems interfere with education. Specific techniques and suggestions are offered for perceptual training, *e.g.*, space perception. Tactile and kinesthetic stimulation are useful, along with copying activities. The "total child must be considered."

Kamin, S. H., Llewellyn, C. J., and Sledge, W. L.: Group dynamics in the treatment of epilepsy, *J. Pediat.*, *53*:410–412, 1958. This article describes methods used in parent education in a pediatric seizure clinic which may be applied in group office practice. Purely medical questions are to be answered by physicians; all other questions are to be discussed by parents as a group.

The clinic team should include a social worker.

Katz, A.: Therapeutic aspects of parent associations for the handicapped, *Cereb. Palsy Rev.* *22*:6–7, 1961. Interviews with 50 parents who were members of parents' associations and whose children were variously handicapped indicated that the greatest benefit derived from membership in a self-organized group is a therapeutic value. Many were anxious and hypersensitive, feeling rejected by professionals. Therapeutic value is achieved through (1) group participation and (2) actual, concrete help with daily life experiences.

Lennard, H. M.: Vocational implications for the cerebral palsied, *Cereb. Palsy Rev.*, *23*:13–17, 1962. A half-day work program for one month during the summer was designed and tried out at a United Cerebral Palsy Work Evaluation and Classification Unit. Seventeen (CA 15; IQ 80; 13 boys, 4 girls) individuals participated. Prior to the experience, counselors attempted to obtain the vocational aspiration level of the parent and the child. This was repeated at the end of the month. The work activity consisted in a work-sample approach with graphs to help the client judge his productivity. At the end of the project, "before and after" interviews were rated blindly by two judges. There was a change from an extreme rating (*i.e.*, very high or very low aspirations) to a middle rating in 71 percent of the parents and 86 percent of the clients. Parents from low social and economic groups tended to change less than parents from high groups. A case illustrates this: A boy who had initially wanted to be a lawyer spoke of becoming a law clerk at the end.

Levy, S.: Post-encephalitic behavior disorder—a forgotten entity: a report of 100 cases, *Amer. J. Psychiat.*, *115*:1062–1067, 1959. Postencephalitic behavior disorder as a clinical syndrome has been neglected recently in favor of psychogenic theories, particularly in regard to delinquency. The author claims that treatment by drugs for this condition in 100 cases has yielded "uniformly excellent results." Several cases are cited to illustrate his point.

McCartney, L. D.: A differential program for mentally retarded children of the exogenous group, *Train. Sch. Bull.*, *51*:27–33, 1954. This outlines a program for 6- to 10-year-olds, with IQ's from 50 to 70, whose retardation is from noninherited causes. Methods, techniques, and content found useful in the communicative arts, *e.g.*, speech, writing, and reading, are suggested.

McCartney, L. D.: A technique for developing social competency with a group of exogenous children classified as mentally retarded, *Amer. J. Ment. Defic.*, *59*:1–5, 1954. A group of parents of exogenous children (IQ 50–79) was invited to see a class demonstration each month. Taking Doll's Social Maturity Scale, the teacher explained the items and their rationale and how the school attempted to teach the items. Discussion involved the role the parent can play. The parents responded and "seemed happy."

McCartney, L. D.: Helping mentally deficient children of the exogenous type showing central nervous system impairment to make better social adjustment, *Amer. J. Ment. Defic.*, *61*:121–126, 1956. On the basis of experience with 12 children (CA 6–9; IQ 50–70; MA 3–6), the author proposes a method to enhance social adjustment, *e.g.*, playing card games to overcome apathy, structuring assignments with repetition to train for following through, alternating activities to adapt to change, and exchanging toys to prevent perseveration. Methods of applying the learned procedures in social situations are presented.

Messner, S. A.: Attempts to meet the problem of long-term care for patients with cerebral palsy, *Cereb. Palsy Rev.*, *22*:14–23, 1961. The diagnostic category of cerebral palsy gives little indication of problems related to long-term care. Families should be encouraged and assisted to keep their child home rather than to institutionalize him. Many supportive services can be organized in every community. Residential facilities for cerebral palsied are not indicated. The paper is discussed by A. Ghiora, M. O'Donnell, J. T. Mitchell, G. Tardieu, and O. Roberts. Roberts presents recent data on survivorship in cerebral palsy for different ages. These data contradict the assumption that survivorship rates are the same as for normal people. The mortality rate rises with severity of disability and age.

Pollack, C.: Sleep-learning as an aid in teaching reading to a brain-injured boy, *J. Ment. Defic. Res.*, *6*:101–107, 1962. After presenting a review of 10 studies demonstrating some positive effects of sleep-learning, including one partially successful attempt to teach speech to an aphasic child, a case study of a 17-year-old boy is cited. The boy, a nonreader (IQ 71) with "an organic brain syndrome of a developmental character," was tested on two sets of words to assure equal difficulty. Both tests were consciously learned; the experimental list was sleep-learned in addition. Errors and number of attempts were scored. A significant gain was found in the accuracy of synthesizing words as well as in the number of attempts with which words were attached. Auditory material is learned during sleep. A Pavlovian theory is offered.

Posniak, A. O., Saturia, P., Tobis, J. S., and Wallace, H. M.: Evaluation of rehabilitation of the severely handicapped cerebral palsied child, *Arch. Phys. Med.*, *39*:482–487, 1958. A 40-bed children's unit was opened in 1954 at Bird S. Coler Hospital, New York City, for severely disabled cerebral-palsied youngsters. A review of the functional accomplishments of 53 consecutive patients (average length of treatment: 11 months) shows that ambulation training as well as self-care skills can be taught successfully to even the most severely retarded. Type of motor disturbance, number of extremities involved, and intelligence quotients are intercorrelated. Progress by IQ groupings is recorded for feeding, dressing, ambulation, wheelchair activities, toileting, and speech. Criteria for speech improvement are most difficult to quantify.

Sarvis, M. A.: "Psychiatric Implications of Temporal Lobe Damage," in *Psychoanalytic Study of the Child*, eds. R. S. Eissler, A. Freud, H. Hartmann, and M. Kris, Vol. 15. International Universities Press, 1960. A six-year-old boy who had had temper tantrums since the age of nine months was referred for an EEG because of the intensity of his mother's anxiety and because his behavior did not fit the neurotic interactions of the family. Extensive focal and degenerative lesions in the right temporal lobe were discovered. The case history is presented in detail to demonstrate how psychogenic theories may be prematurely invoked and to illustrate the strategies for management. These included anticonvulsive medication, encouragement for the parents to trust their own judgment, reducing school pressure, and psychotherapy for the boy. The various psychodynamic themes that recurred in the course of therapy, including doll play, form the major part of the paper.

Simar, A.: About the re-education of cerebal palsy, *Cereb. Palsy Rev.*, *22*:7–8, 1961. On the basis of a 10-point scale developed for each of a number of activities, including ambulation, occupational therapy, speech therapy, intelligence, and education, the author plotted the progress of 27 children seen at cerebral palsy centers in Brussels, Belgium. A number of conclusions are suggested: (1) motor progress is not related to intelligence; (2) progress is greatest at the beginning of treatment; (3) the earlier treatment begins, the better the results; (4) improvement for all groups on the scales described ranges from 20 to 30 percent.

Sortini, A. J.: Rehabilitation of brain-damaged children, *Volta Rev.*, *63*:101–105, 1961. Speechreading and auditory training are useful for the child who is hearing-handicapped as well as brain-damaged. Clinicians should try to establish relationships with such a child. Lauretta Bender's designation of difficulties in patterned motor behavior, severe anxiety, and the need for human support are useful. Problems in teaching speechreading stem from short retention span in addition to the neuromuscular impairment. Suggestions on how to deal with practical problems in working with the cerebral-palsied child are offered. A wholistic approach, which emphasizes using what works, is offered.

Spankus, W. H., and Freeman, L. G.: Hypnosis in cerebral palsy, *Int. J. Clin. Exp. Hypnosis*, *10*:135–139, 1962. Hypnosis was used with 19 cerebral-palsied patients. Four definitely benefited but, in general, the results were not remarkable. In the 4 cases, improvement was noted in speech, ambulation, decreased pain, and increased extroversion. Librium, trancopal, and nembutal did not facilitate the trance. The interpersonal relationship during therapy probably helped as much as the hypnosis. In view of the occasional benefits with this treatment, further study is warranted.

Ward, M. M.: Group therapy for eleven preschool cerebral palsied children, *Except. Child.*, *21*:207, 1955. A detailed account of the purposes and content of weekly group sessions of one-and-a-half hours. The mothers conducted physiotherapy and speech therapy in a group, under professional supervision. They also received informal talks on health needs, general care, and community resources.

Watkins, H. A.: Visual perception training for the moderately retarded child, *Amer. J. Ment. Defic.*, *61*:455–460, 1957. Principles, theories, and methods described by Strauss are applicable to the field of mental deficiency. The qualifications for using the method, the design of the classroom, and methods and materials are illustrated in the program at the Polk State School. Beneficial effects have been achieved in children with IQ's as low as 15.

Whitehouse, F.: When does vocational preparation start? *Cereb. Palsy Rev.*, *12*:7–8;14, 1951. Preparation of a child for a vocation begins at an early age—almost from the time he is born. Parents of cerebral-palsied children should be made to realize this even more than other parents. A child must be taught to live and assume those responsibilities which will make him vocationally acceptable. Very often the "C.P. personality" includes traits that present problems in vocational guidance and placement.

Young, E. H.: The moto-kinesthetic method as applied to the cerebral palsied, *Cereb. Palsy Rev.*, *23*:7–8, 1962. The mother or teacher may set the pattern for the child to follow by using her own fingers to move the lip to the desired position and then uttering the sound. The child then imitates this. The mother must try to locate the source of the sound and move the mouth as a pattern. Muscular habit training of speech is a difficult and dynamic process.

6. REVIEWS, OVERVIEWS, AND THEORIES

Allen, R.: "Cerebral Palsy," in *Psychological Practices with the Physically Handicapped*, eds. J. F. Garrett and E. S. Levine. Columbia University Press, 1962. This is a review elucidating the incidence, etiological factors, definitions and classifications, medical aspects, and psychological aspects and implications. Half of the 32 pages of text are devoted to the special considerations in psychological appraisal. A brief section on rehabilitation and research needs concludes the text. It is a good introduction for beginning psychologists.

Asher, P., and Schonell, F. E.: A survey of 400 cases of cerebral palsy in childhood, *Arch. Dis. Child.*, *25*:360–369, 1950. Statistics on a survey of children in the Midlands (England) are given. The sample is thought to be representative. Incidence is one case per 1000. Data on types of cerebral palsy and etiology are presented. Approximately 50 percent achieved IQ's below 70, for both athetoids and spastics. Mean IQ correlated negatively with severity of disability. School attainments of the normally intelligent children showed considerable retardation. Special education is needed. A great deal of data are presented.

Baer, P. E.: Problems in the differential diagnosis of brain damage and childhood schizophrenia, *Amer. J. Orthopsychiat.*, *31*:728–738, 1961. Problems exist not only in distinguishing between the conditions; there is disagreement and uncertainty even within each condition. A review of the symptoms ascribed to childhood schizophrenia illustrates this. Likewise, the assertion that hyperkinesia is the only, or even major, response to brain damage is an oversimplification. A variety of descriptions in recent studies of brain-damaged children are reviewed. The organic components in childhood schizophrenia and the psychogenic factors in brain damage suggest that parallel sources of etiology in specific cases be acknowledged.

Beck, H. S.: Detecting psychological symptoms of brain injury, *Except. Child.*, *27*:59–63, 1961. This paper is a summary of the incidence of brain injury. A list of 43 symptoms commonly ascribed to the non-motor-handicapped child is presented with the stress on the "disturbance of integrative behavior." A discussion of some findings on general intelligence tests (*e.g.*, scatter) indicates their helpfulness. Tests designed to measure specific functions have not withstood replication when applied to children, although the Ellis Visual Designs and the marble board appear promising. The major problem seems to be in discriminating the brain-injured child from the emotionally disturbed one. One possible reason for this state of affairs is that the emotionally disturbed child may develop changes in body chemistry. In practice, the presence of brain injury may make no difference in how the child is managed.

Bender, L.: The brain and child behavior, *Arch. Gen. Psychiat., 4*:531–547, 1961. In summarizing the intellectual forces which contributed to her thinking, Bender pays tribute to Percival Bailey, in whose honor this paper was presented. She propounds the thesis that "disordered maturation, mentation and behavior, autistic and neurotic defenses and the ongoing development, behavior and mentality of brain-injured and schizophrenic children can be understood from what we know of the evolution and development of the brain as the organ of biological homeostasis, mentality, and behavior of the organism as a whole."

Benton, A. L.: Behavioral indices of brain injury in school children, *Child Develop., 33*:199–208, 1962. The use of behavioral indices as a criterion for brain damage is complicated by the fact that not all brain-damaged children show signs of behavior impairment. Furthermore, the indices vary. The most common is gross mental retardation (which in itself is not always a sign). The brain-damaged child of adequate intelligence may show motor, intellectual, and personality aberrations. Hyperactivity is the primary symptom. Clinical tests are merely refined methods of observation and do not bear directly on the question of brain damage. Clinical studies of nonretarded, non-motor-handicapped brain-injured children reveal the presence of (1) variability of behavior, (2) sensorimotor disturbances, and (3) a variety of other problems including school difficulties. Other approaches, *e.g.*, linguistic behavior, may prove useful in picking up subtle changes in higher level functions. A review of animal studies and the work of the Boston group on the postencephalitic child constitute the data for the article.

Block, W. E.: Some experimentally based implications for personality habilitation of children with cerebral palsy, *Cereb. Palsy Rev., 17*:4–7;12, 1956. Drawing on the findings of a previously reported study comparing 20 spastic with 18 athetoid children (CA 9–14), the author concludes that the emotional problems in cerebral palsy have been underestimated. Sources of frustration arise within the family setting, but they seem to be related ultimately to the broader social setting. The child shows an inordinate need for affection and acceptance by adults. The carry-over of these attitudes to rehabilitation personnel is examined.

Bucklew, J., and Hafner, A. J.: Organismic versus cerebral localization of biological defects in feeblemindedness, *J. Psychol., 32*:60–78, 1951. This paper reviews literature on feeblemindedness as it is associated with brain defects, especially defects of cortical tissue, to determine the factual basis for localizing feeblemindedness in cerebral defect. Many feebleminded persons, especially the less severe cases, have no discernible organic deficiency or anomaly, indicating the necessity for considering concrete circumstances of personal development to account for the beginnings of retardation.

Cardwell, V. E.: *Cerebral Palsy: Advances in Understanding and Care,* Association for the Aid of Crippled Children, 1955. This book is addressed to students and professionals specializing in this field. "It will be valuable for teachers who are interested in well-organized scientific material . . ." and for "parents who desire something more than run-of-the-mill information." Prepared with the advice of more than 30 consultants, topics range from detailed consideration of the medical background and diagnosis through the community aspects of cerebral palsy. More than half of the book is concerned with the cerebral-palsied individual and his habilitation. The level of the content ranges from lay discussions for parents and teachers to considerably technical discussions for neurologists and other professionals. Its 26 chapters encompass just about all facets of the problem and include good introductory bibliographies.

Cerebral palsy: parent views on diagnosis and treatment, *Nervous Child, 8*:107–261, 1949. This entire issue of *The Nervous Child* is devoted to cerebral palsy. There

are 15 articles covering medical, social, psychological, speech, recreational, and vocational areas in addition to a review of the problem in Britain. The authors are: Phelps, Perlstein, Josephy, Putnam, Burgmeister and Blum, Little, Bice, Palmer, Kinov, Oderoff, Deaver, Brunner, Gilden, Dowd, and Creak.

Cromwell, R. L.: Theory and research in activity level, *Train. Sch. Bull.*, *4*:134–141, 1963. Using the ballistograph as the major, but not exclusive, index of activity level, the author tries to pull together different theoretical approaches which may lead to an integrated conception of activity level. Implications from the following theories are deduced and applied to some recent research in activity level: (1) Strauss-Lehtinen-Kephart theory, (2) Arousal theory, (3) Drive theory, (4) Gellner's theory, (5) Zaporozhet's theory, (6) Bindra's Formulation, and (6) McKinney's Factor Analysis. It is best not to view theories as totally correct or incorrect but as working tools for developing hypotheses. Activity level must be regarded as a complex construct that can be subdivided into poorly understood components.

Cruickshank, W. M., and Raus, G. M.: *Cerebral Palsy; Its Individual and Community Problems.* Syracuse University Press, 1955. This book is a text prepared by a variety of authorities. Contents include: (1) "Size and Scope of the Problem," by W. M. Cruickshank and G. M. Raus. (2) "Medical Aspects," by E. Denhoff. (3) "Evaluation of Intelligence," by H. V. Bice and W. M. Cruickshank. (4) "Personality Characteristics," by W. M. Cruickshank and H. V. Bice. (5) "Hearing and Speech Problems among Cerebral Palsied Children," by L. M. DeCarlo and W. W. Amster. (6) "Physical Therapy," by E. C. Snell. (7) "Occupational Therapy," by R. Hadra. (8) "Educational Planning," by W. M. Cruickshank. (9) "Mental Retardation and Cerebral Palsy," by G. O. Johnson. (10) "Parent Education and Counseling," by H. V. Bice. (11) "Realistic Vocational Guidance and Placement," by J. G. Garrett. (12) "Social Casework in Relation to Cerebral Palsy," by G. White. (13) "Total Community Planning for the Cerebral Palsied," by M. Abbott. (14) "The Rehabilitation Process," by G. M. Raus.

Daley, W. T.: *Speech and Language Therapy with the Brain-Damaged Child.* Catholic University Press, 1962. This is the proceedings of the seventh Special Education Workshop at Catholic University. It contains 10 papers and an introduction by Richard Masland, which consists of an overview of the research approaches to the problems of language disabilities in children. The topics include: neurological and psychological approaches, differential diagnosis, clinical evaluation, and evaluation of the preschool child. Reports of special programs, such as the study of the aphasic child at the Central Institute for the Deaf and the educational procedures used in the Syracuse study of brain-injured children, appear along with a chapter on psychotherapy. The audience was drawn mainly from the fields of speech therapy and special education.

DeHirsch, K.: Gestalt psychology as applied to language disturbances, *J. Nerv. Ment. Dis.*, *120*:257–261, 1954. Clinical observation indicates that it is possible to predict future dyslexias in a fairly large percentage of 3-, 4-, and 5-year-olds who were originally referred on account of motor-speech delay, developmental word-deafness, and severe dyslalia. A generalized language disability is postulated to account for this. There are basic and underlying dysfunctions in motor, perceptual, and emotional performance. A defect in the ability to experience and respond in terms of Gestalten is thought to account for the general lack of integration.

Denhoff, E., Laufer, M. W., and Holden, R. H.: The syndromes of cerebral dysfunction, *J. Okla. Med. Ass.*, *52*:360–366, 1959. The term "brain-injured child" or "brain-damaged child" might well be replaced by the phrase "Syndromes of Cerebral Dysfunction." The following syndromes are included: (1) cerebral palsy, (2) mental retardation (organic), (3) convulsive disorders, (4) sensory disorders, (5) hyperkinetic disorders, and (6) perceptual disorders. These syndromes correspond to the primary area of dysfunction, including the neuromotor, intellectual, consciousness, neurosensory, behavioral, and perceptual, although more than one category of dysfunction may be present in a single syndrome. Newer methods of diagnosis, including psychological tests that are sensitive to visuo-motor deficit, EEG advances such as the Gestalt photo-Metrazol test, sensory tests, tests of tactual discrimi-

nation, formboard perception, and visual perceptual tests such as the Archimedes Spiral are very useful. Some of the findings on a small number of a variety of cases which represent different subsyndromes are presented to illustrate the tests. Many of the clinical disturbances are due to diencephalic dysfunction.

Denhoff, E., and Robinault, I. *Cerebral Palsy and Related Disorders: A Developmental Approach to Dysfunction*. McGraw-Hill, 1961. This book is based on the notion that growth and development are an ever-changing aspect in the lives of children with a variety of central nervous system disturbances. After a definition and description of these disturbances, including an historical overview of the field, a detailed analysis of sensory and perceptual motor dysfunctions is presented. This is followed by a comprehensive medical approach to diagnosis, prognosis, and treatment, which include the findings and uses of the team approach. Chapters on neuromuscular education, psychological functioning, education and community care, and illustrative cases round out the book. The materials present an integration of research literature and practical clinical experience at the Meeting Street School and Emma Pendleton Bradley Home, both located in Providence. An appendix of pertinent films for professional use and a good bibliography at the end of each chapter are provided. The information presented ranges from the technical to the nontechnical.

Denhoff, E., Smirnoff, V. N., and Holden, R. H.: Cerebral palsy, *New Eng. J. Med. 245*:728–735;770–777, 1951. Cerebral palsy is a brain-damage syndrome rather than a disease entity. Its definition, causes, and treatment are surveyed. Special consideration is given to psychiatric and psychologic factors, and a rationale based on physiopathology, neuropathology, and neurophysiology is offered. The authors discuss early clinical diagnosis and suggest some clinical practices, with emphasis on a wholistic rehabilitation program. The nonmedical components, such as parental attitudes and vocational guidance, which influence rehabilitation are discussed.

Doll, E. A.: Mental deficiency vs. neurophrenia, *Amer. J. Ment. Defic., 57*:477–480, 1953. Differences between mental deficiency and neurophrenia are pointed out. The prognosis for neurophrenia is more favorable. The concept of neurophrenia is still at the exploratory clinical level. Methods of treatment and management are also at the speculative, experimental stage. Although difficult to define precisely, the flavor of the term "neurophrenia" may be gleaned from the following: ". . . in place of specific areas of impairment such as is apparent in cerebral palsy, aphasia, etc., the neurophrenic has a more generalized involvement. . . . It is impossible, here, to reproduce the total behavior complex of neurophrenia except to emphasize that, in addition to such areas as perception, laterality, language, rhythm, and so on, the over-all consequences are apparent in generalized incoordination not amounting to cerebral palsy, generalized expressive retardation not amounting to mental deficiency, personality disorders not amounting to schizophrenia, intermittency of behavior not indicative of epilepsy, and withdrawn behavior not resembling autism."

Doll, E. A.: *Behavior Syndromes of CNS Impairment: Neurophrenia, Cerebral Palsy, and Mental Deficiency*. Devereux Schools, 1954. This publication consists of two previous papers by Doll, "Distinction between Neurophrenia and Cerebral Palsy" and "Mental Deficiency vs. Neurophrenia."

Edgerton, R. B., and Sabagh, G.: From mortification to aggrandizement: changing self concepts in the careers of the mentally retarded, *Psychiatry, 25*:263–272, 1962. The process by which the high-level retarded is stripped of his self-esteem in his daily competition in the world is examined. The usual mortification following placement in a total institution is often turned into a vehicle for enhancing self-esteem by denial and the use of the following rationalizations: (1) he makes invidious comparisons with lower IQ-level retardates, (2) peer-group relationships support an acceptable, "nonretarded" conception of self, (3) employees encourage a more acceptable self-image, and (4) unrealistic avenues of self-aggrandizement are sought. Those patients who eventually adjust following discharge have been helped by the hospital to have a nonretarded view of themselves.

Eidinova, M. B.: Principles of compensatory work in cerebral palsy of children, *Cereb. Palsy Rev., 22*:27–28, 1961. The lability of motor functions can be explained

by the presence of neurodynamic functional cerebral disorders, as a result of which the correlations and interchange of the inhibitory and excitatory processes in the motor-functional system become deranged. Therapy is guided by the attempt to readjust functions in the central nervous system. Experience indicates that during the whole period of growth, galanthanism and other preparations of a normalizing action in combination with pathogenetically determined corrective gymnastics and other medical measures are advisable.

Freidman, A., and Levinson, A.: Neurologic disorders in children, *Arch. Pediat.*, *72*:51–69, 1955. A survey of in-patient admissions to the Children's Division of the Cook County General Hospital, one of the largest pediatric neurology clinics in the country, during a 12-month period in 1953, yielded 282 relevant cases. Of these, there were 65 cases of meningitis, 50 with convulsions and mental disorder, 37 with birth injury (mostly cerebral palsy), and 37 with encephalitis. Acute infections seemed to be the largest problem, with birth injuries next. Whereas antibiotics helped with the former, there were no great gains in preventing or treating the latter. A variety of less frequently occurring disorders (*e.g.*, congenital malformations, subdural hematoma, sickle-cell anemia, lead encephalopathy) are discussed. Comments on treatment and outcome are offered.

Garmezy, N.: Some problems for psychological research in cerebral palsy, *Amer. J. Phys. Med.*, *32*:348–355, 1953. Many initial questions may be asked: Is intelligence the sole determiner of effective learning and retraining? What techniques and procedures should we use to secure optimal learning of motor skills? How can we predict successful adjustment? Examples of studies being carried out are: (1) In a learning study on 25 children, verbal reward did not influence learning; but the mere presence of material incentives, whether for reward or punishment, improved learning; (2) A picture choice test was used in an attempt to measure dependency behavior; (3) Personality ratings of fear, love, and anger by the hospital staff did not distinguish athetoids from spastics in accordance with Phelps's theory.

Gauger, A. B.: Statistical survey of a group of institutionalized cerebral palsy patients, *Amer. J. Ment. Defic.*, *55*:90–96, 1950. 149 (18%) institutionalized mental defectives were diagnosed as having cerebral palsy. Ages ranged from 3 to 64, intelligence from low idiot to high moron, and physical disability from monoplegia to total disability. Causes included trauma (50%), infection (21%), and developmental defects (29%). Most significant of the birth factors was that in 45 percent of the cases the child was first-born or born after a ten-year interval. Incidence of spasticity (93%) exceeded athetosis (10%). The nonambulatory group (56%) were in the lower IQ categories. The average case was diagnosed by the age of one but was not filed for admission until the age of seven. The lower the intelligence and the greater the physical handicap, the earlier the child should have institutional placement. Epilepsy is an important factor. "We must realize that a major problem exists in convincing families of these children that early placement is advisable."

Gellner, L.: *Various Sources Contributing to the Clinical Picture of Abnormal Behavior in a Retarded Child*, Julian D. Levinson Foundation for Mentally Retarded Children, 1959. A neurophysiological theory on mental retardation is presented in this series of five lectures. A theory of perceptual disturbance is offered to account for aberrant productions. The implications of the theory for diagnosis and education are presented.

Goldstein, M., ed.: *Psychological Services for the Cerebral Palsied*, United Cerebral Palsy Associations of New York State, 1956. This book comprises four papers presented at a symposium in 1955. (1) "Critical Analysis of Psychological Tests in Use with the Cerebral Palsied," by H. Michal-Smith. Michal-Smith's paper is a general review of the many problems and criticisms of existing psychological tests, with the conclusion that tests are valid despite the criticisms and that we err in the direction of overestimation rather than underestimation. (2) "The Role of the Psychologist in Habilitation of the Cerebral Palsied," by G. R. Stephenson. Stephenson describes the role of the psychologist in evaluation and treatment. He presents data to indicate that IQ and personality predict progress less well than severity of physical handicap in occupational and physical therapy. (3) "Theo-

retical Aspects of Psychological Behavior in the Brain Damaged," by H. G. Birch. Birch attempts to re-individualize the problem of central nervous system damage by examining the mechanisms which mediate the varieties of brain damage and behavioral dysfunction; *e.g.*, we must distinguish a variety of parameters, including the place, extent and type of injury, when it occurred, whether it disorganizes the capacity to inhibit stimuli, and whether it interferes with the hierarchy of sensory relationships. (4) "Psychological Research Needs in Cerebral Palsy," by E. Miller. Miller points out that we are ignorant of the basic interplay of the organic and the functional. She raises a number of unanswered empirical questions, including what child benefits from which treatment, and urges that we construct tests which will not penalize the child for his handicap.

Graham, F. K., and Berman, P. W.: Current status of behavior tests for brain damage in infants and preschool children, *Amer. J. Orthopsychiat.*, *31*:713–728, 1961. The authors indicate that few conclusions can be drawn from this extensive, sophisticated survey of tests for brain damage in young children. It is only in the last decade that interest has extended to preschool children. In this review, an attempt has been made to relate measurement problems to other unsolved research problems and to show that both must be considered in studying the nature of a preschool group. Measurement difficulties lie less in the ability of investigators to devise ingenious techniques than in the stubborn problems of defining a brain-injured group. Longitudinal studies should help clarify some of the controversial questions, *e.g.*, does undetected brain injury at birth contribute to later defects? There is no definitive evidence that test patterns can distinguish brain-injured from non-brain-injured children. A review of the literature is followed by an extensive bibliography.

Haring, N. G.: Cerebral palsy and emotional adjustment; a review of research, *Except. Child.*, *25*:191–193, 1959. Studies dealing with the emotional adjustment of cerebral-palsied children reveal no evidence for personality differences between spastic and athetoid types, although brain injury can lead to specific behavioral problems. Twin studies show that the cerebral-palsied twin is less adjusted than his co-twin control. This is thought to be a function of the adverse effects of parental over-protection. Parental consistency, evaluating the child on the basis of his own rate of development rather than external norms, and a structured environment are most helpful.

Herlitz, G., and Redin, B.: The prevalence of cerebral palsy, *Acta Paediat.*, *44*:146–154, 1955. To account for the differences in estimates of prevalence in different countries, methods of estimating prevalence are examined. A report is made of a survey of incidence in Sweden in a group of 2- to 11-year-olds in a population of 265,000. Data are presented and findings are compared with previous literature. Mother's health and baby's birth weight are recorded. 57 percent had IQ's below 70.

Hill, A. S.: Cerebral palsy, mental deficiency, and terminology, *Amer. J. Ment. Defic.*, *59*:587–595, 1955. This is a review of the relationship between cerebral palsy and mental deficiency, with a discussion of recent findings in the psychological and educational literature. Educators should view cerebral palsy not in terms of orthopedic parameters but in terms of educational parameters. If most cerebral-palsied are retarded, what are the implications of these findings for education? We must redefine educability and trainability in terms of multiple handicapping conditions.

Holden, R. H.: A review of psychological studies in cerebral palsy: 1947 to 1952, *Amer. J. Ment. Defic.*, *57*:92–98, 1952. A review of research shows 91 articles in *Psychological Abstracts* from 1947 to 1952 in contrast with 17 from 1931 to 1946. During the five-year period, most attention was paid to the problem of intellectual evaluation. Most studies indicate 45 to 50 percent incidence of retardation when flexible test procedures are used. Test results seem fairly stable, including data from several cerebral palsy clinics in this country and one from England. Newer test instruments (Raven's Progressive Matrices and Ammon's Full Range Vocabulary Test) are briefly presented. Absence of empirical study of personality, parent-child relations, and research on basic psychological processes such as distractibility is

noted. Absence of an adequate theory is noted.

Hughes, J. G.: *Symposium on Brain Damage in Children, Pediatric Clinics of North America*. W. B. Saunders Co., 1957, pp. 981–1093. This symposium "for newer practical and useful information" includes: (1) "Experimental Teratology," by J. Washing, H. Kalter, and J. Geiger. (2) "The Causes and Prevention of Cerebral Palsy," by N. Eastman. (3) "The Early Diagnosis of Cerebral Palsy," by L. P. Britt. (4) "The Physician's Responsibility," by R. K. Byles. (5) "Psychological Aspects of the Management of Children with Defects or Damage of the Central Nervous System," by S. D. Garrard and J. B. Richmond. (6) "Characteristics and Management of Children with Behavior Problems Associated with Brain Damage," by C. Bradley. (7) "The Study of the Epileptic Child," by J. G. Hughes. (8) "The Drug Therapy of Epilepsy, with Special Reference to Newer Drugs," by M. A. Perlstein.

Illingworth, R. S.: *Recent Advances in Cerebral Palsy*. Little, Brown & Co., 1958. This is a collection of essays designed to present an up-to-date account of cerebral palsy. The contributors, most of whom are British, present information on the classification problem, brain changes, diagnosis, survey of the handicaps, deafness in cerebral palsy, psychological and educational practices, community services, and therapeutic procedures including equipment, drugs, speech, surgery, and physiotherapy. The ten British contributors for the most part cite references and studies reported in British journals, whereas the four American authors cite more references in United States journals. In addition to the survey, there is a useful bibliography for each section.

Katz, A. H.: *Parents of the Handicapped: Self Organized Parents' and Relatives' Groups for Treatment of Ill and Handicapped Children*. Charles C. Thomas, 1961. Four self-organized parents' groups (children were cerebral palsied, had muscular dystrophy, were emotionally disturbed, or retarded) were studied in terms of motivations of the founders, their origins, relations to community agencies, attitudes of leaders and members, and development of professional services. The nature of parental participation was examined in the light of sociological theory. The relationships of the groups to community agencies and professional workers were surveyed. Data were based on interviews with 53 leaders and members, 25 professional workers who had contact with the groups, and a review of written documents. The similarities and differences between the groups are reviewed. A hypothesis about the nature of self-organized groups is formulated.

Kempf, E. J.: Abraham Lincoln's organic and emotional neurosis, *Arch. Neurol. Psychiat.*, *67*:419–433, 1952. Genetic inferences are made from photographs of Lincoln's face. At the age of ten he was kicked by a horse, probably resulting in a fractured skull. Evidence from photographs shows a sharp depression in the forehead above the left eye and asymmetry in facial expression. Visual discoordination was noted by many observers. He complained of diplopia and consulted several physicians for his nervousness, drowsiness, and melancholia. There is evidence of how he attempted to adapt to neurovisual difficulties. A theory of where the damage occurred and the interplay with emotional forces in the background is presented.

Klebanoff, S. G., Singer, J. L., Wilensky, H.: Psychological consequences of brain lesions and ablations, *Psychol. Bull.*, *51*:1–42, 1951. A review of 307 studies on brain injury is presented, covering work done during the previous decade. The early '40's witnessed a concern with relating mental functions to localized areas of the brain, the determination of brain pathology on the basis of test data, and the definition of the organic mental syndrome. Later work showed a reliance on more sophisticated, specialized test techniques, more interest in developmental aspects of brain injury, emphasis on patterns of functioning, and "overly hasty concentration of effort upon the psychological consequences of psychosurgery." There was less optimism about the possibility of psychological test technique contributing toward pinpointing brain pathology. Laboratory methods, it was felt, hold greater promise than omnibus assessment techniques. Impairment in brain-injured children parallels that in brain-injured adults; however, children manifest unevenness suggesting more gen-

eralized effects of cerebral damage. Distinction between exogenous and endogenous retardation appears promising.

Mills, M. A.: Facilities and programs for the mildly retarded, severely involved cerebral palsied in the city and county of San Francisco, *Cereb. Palsy Rev.*, *22*:5–9, 1961. This survey of facilities for mildly involved cerebral palsied (CA 12–20, IQ 50–80) reveals the existence of a variety of uncoordinated programs with gaps and overlaps. Need for additional facilities and a single coordinating agency is pointed out.

Mitchell, R. G.: The growth and motor development of children with cerebral palsy, *Cereb. Palsy Rev.*, *22*:3–7, 1961. A survey in eastern Scotland (1955–1957) showed the incidence of cerebral palsy to be 2.0 per thousand, or 240 cases. The findings are similar to those in other surveys in the United Kingdom. 78 percent were spastics. None of the other types exceeded 10 percent. The children were below normal standards in all body measurements except body weight. Deviations were greatest in spastic tetraplegia. Right-sided hemiplegics were retarded in growth to a greater degree than left-sided hemiplegics. Developmental data on the achievement of motor skills were untrustworthy. Reliable data on sitting and standing unaided are presented.

Mitchell, R. G.: Mixed types of cerebral palsy, *Cereb. Palsy Rev.*, *23*:3–6;13–15, 1962. In a survey of 240 cases of cerebral palsy in Scotland, 23 (9.6%) had mixed types of cerebral palsy. The main clinical features of these cases and the difficulties in making their diagnoses are presented. A table of the findings of 15 previous investigators who surveyed more than 5000 cases of cerebral palsy indicates that estimates of mixed diagnoses range from 1 to 13 percent.

Money, J., ed.: *Reading Disability; Progress and Research Needs in Dyslexia*. The Johns Hopkins Press, 1962. This is a report of a conference on dyslexia and related aphasic disorders. The introduction is by L. Eisenberg and the contents, listed by chapter titles, is as follows: (1) "Dyslexia, a Post-Conference Review," by J. Money. (2) "Dyslexia, its Phenomenology," by R. E. Saunders. (3) "Dyslexia as an Educational Phenomenon; its Recognition and Treatment," by G. Schoffman. (4) "A Study of Reading Achievement in a Population of School Children," by J. R. Newbraugh and J. G. Kelly. (5) "Dyslexia–Psychiatric Considerations," by R. D. Rabinovitch. (6) "Dyslexia in Relation to Form Perception and Directional Sense," by A. L. Benton. (7) "Dyslexia in Relation to Cerebral Dominance," by O. L. Zangwell. (8) "The Anatomy of Acquired Reading Disorders," by N. Gerschwind. (9) "An Approach to the Quantitative Analysis of Word Blindness," by D. Howes. (10) "Dyslexia and the Maturation of Visual Function," by H. G. Birch. (11) "Dyslexia in Relation to Diagnostic Methodology in Hearing and Speech Disorders," by W. G. Hardy. (12) "Dyslexia–its Relation to Language Acquisition and Concept Formation," by J. M. Wepman. (13) "Reading Difficulties as a Neurological Problem," by H. R. Prechtl. A glossary and consolidated bibliography are included.

Newland, T. E.: Psycho-social aspects of the adjustment of the brain injured, *Except. Child.*, *23*:149–153, 1957. A general discussion of the adjustment of brain-injured children is presented. The implications of perceptual and conceptual disturbances for social relationships and self-concept are discussed. Psychological phenomena of the brain-injured must be understood in terms of more generic facts and principles of learning, perception, etc.

Perlstein, M. A.: The child with cerebral palsy, *Nat. Educ. Ass. J.*, *41*:215–216, 1952. (Reprinted in *The Exceptional Child*, eds. J. F. Magary and J. R. Eichorn. Holt, Rinehart & Winston, 1961.) Cerebral palsy is a disturbance in motor function due to brain injury. It occurs once in 200 births. There are three major types: athetoid, spastic, and ataxic. Visual, auditory, speech, and intellectual impairment occurs. Nutrition and dental care are important. The goals of rehabilitation are to improve locomotion, self-care, communication, appearance, and vocational and avocational self-fulfillment. Clinical characteristics and suggestions for teachers are mentioned.

Pollock, M.: Brain damage, mental retardation, and childhood schizophrenia, *Amer. J. Psychiat.*, *115*:422–428, 1958. Intellectual functioning of children diagnosed as schizophrenic is reviewed. More than 50

percent can be classified as borderline or retarded. On perceptual-motor tests, the performance of the intellectually retarded schizophrenic children is similar to that observed in younger normal children, adult retardates, and adults with brain damage. Neither childhood schizophrenia nor mental retardation is a distinct clinical entity. Where severe behavior disorder coexists with intellectual defect in childhood, the altered behavior may reflect cerebral dysfunction. Which aspect is stressed—the retardation or the behavior disorder—is, in part, a function of the observer; it is not dictated by the child's behavior. A number of the studies reviewed utilized brain-damaged subjects as controls.

Psychological Problems of Cerebral Palsy, National Society for Crippled Children and Adults, 1952. This is a collection of papers that were presented at a symposium held by the American Psychological Association in 1951. The symposium is alleged to have been the first ever devoted to psychological problems of the cerebral palsied. The papers, which are followed by discussants' comments, include: (1) "Some Anatomical Facts Related to Spasticity," by Douglas Buchanan; (2) "The Psychological Appraisal of Children with Cerebral Palsy," by Charles R. Strother; (3) "Group Counseling with Parents of Cerebral Palsied," by Harry V. Bice; (4) "Distinction between Neurophrenia and Cerebral Palsy," by Edgar A. Doll; and (5) "Educational and Vocational Planning for the Cerebral Palsied Child," by T. Ernest Newland.

Sato, C.: Survey on vocal pitch range of cerebral palsied children, *Cereb. Palsy Rev., 21*:4–5;8, 1960. Motivated by "an ardent desire to have cerebral palsied children sing in unison," the writer conducted an informal test of pitch range on 103 cerebral-palsied children in Tokyo. It was extremely difficult to find a sufficient number of songs to fit the narrow vocal pitch range of the students. Most had difficulty in firmly keeping their respective parts. No definite solution was obtained.

Schlitt, R., and Hopper, G. R.: A survey of scheduling practices of cerebral palsy centers, *Cereb. Palsy Rev., 23*:3–13, 1962. A questionnaire was distributed to 100 cerebral palsy centers throughout the country to survey scheduling practices. Of the 28 that responded, only 6 had full-time medical personnel and only 4 had a full-time psychologist. There was wide disagreement concerning the physical plant and its importance in the establishment of a treatment schedule, although the number of weekly treatments seemed uniform. Further study is needed to establish a causal relationship between a given condition and its degree of involvement and the number of treatments per week which are indicated.

Skatvedt, M.: *Cerebral Palsy*. Oslo University Press, 1958. This clinical study of 370 cases received the King's Gold Medal at the University of Oslo. On the basis of a brief survey of the literature and an intensive examination of etiologic factors, it appears that perinatal brain injury is of major importance. The role of hereditary genetic factors, external fetal injuries, and kernicterus are examined. "The same cerebral injuries which cause perinatal mortality, when of sublethal degree, are also responsible for cerebral palsy." Results of pneumoencephalography, intelligence tests, and EEG's are evaluated by type of cerebral palsy. It is suggested that organic epilepsy, cerebral palsy, and mental impairment due to cerebral lesions should be considered a pathologic entity, with the same etiology and the same pathologic-anatomical basis. Prophylaxis, rather than treatment, is the answer for cerebral palsy as a condition.

Small, J. G.: A psychiatric survey of brain-injured children, *Arch. Gen. Psychiat., 7*:120–124, 1962. These findings were based on examinations of 131 patients seen during a nine-month period in a multidisciplinary clinic for children with cerebral palsy and language disorders. About one-third had emotional problems. Problems appeared more frequently in the older groups and were more common in boys than girls. Factors associated with emotional problems were perceptual defects and emotional difficulties in the parents.

Stevens, G. A., and Birch, J. W.: A proposal for classification of the terminology used to describe brain-injured children, *Except. Child., 23*:346–349, 1957. (Reprinted in *The Exceptional Child*, eds. J. F. Magary and J. R. Eichorn. Holt, Rinehart & Winston, 1961.) In view of the

confusion growing out of the inappropriate use of the term "brain injured" to describe a group of children with mild-to-severe perceptual disturbances and disorganized behavior, it is suggested that the term "Strauss syndrome" may be a useful, delimiting name. The term "brain injured" is open to at least four objections: (1) it is an etiological concept and does not describe the symptom complex; (2) it is associated with other conditions, some of which have no relation to the symptom complex commonly referred to as "brain injury"; (3) it does not help in the development of sound therapeutic approaches; (4) it is not suited to a descriptive purpose, since it is essentially a generic expression, the use of which results in oversimplification.

Strauss, A. A.: The education of the brain-injured child, *Amer. J. Ment. Defic., 56*: 712–718, 1951. (Reprinted in *The Exceptional Child,* eds. J. F. Magary and J. R. Eichorn. Holt, Rinehart & Winston, 1961.) Although the term "exogenous child" was used first, the term "brain-injured child" is preferable in describing any child who comes from a normal family, has a history of brain injury, and who shows characteristic behavioral deviations. In contrast to cerebral palsy, which emphasizes the neurophysiological (sensori-motor) processes, the term refers to the neuropsychological (mental) processes. Among the higher level mental processes affected in the brain-injured child is perception. The author gives a description of figure-ground disturbances in perception and states principles of education for this condition: (1) readjusting normal growth patterns by regressing to lower genetic levels, then progressing to higher ones; (2) directing the organization and integration of mental processes by cueing the stimulus.

Strauss, A. A.: Aphasia in children, *Amer. J. Phys. Med., 33*:93–99, 1954. Aphasia in children is identified as "oligophasia" to signify a deficit in language development, thus distinguishing it from aphasia in adults. A definition and description of types of oligophasia are given, with a brief discussion of tests and treatment.

Strauss, A. A., and McCarus, E. N.: A linguist looks at aphasia in children, *J. Speech Hearing Dis., 23*:54–58, 1958. This is a review of theoretical constructs of the contributions of linguistics to the rehabilitation of aphasic children. It may be necessary to view faulty enunciation of aphasic children as a motor inadequacy. If echolalia is merely an advanced form of babbling, there is little to be gained in using it to train a 10-year-old aphasic child. Linguists can assist speech therapists in the selection of materials, the choice of nouns and verbs, and the use of echolalia or gestures.

Taft, L., Delagi, E. F., Wilkie, O. L., and Abramson, A. S.: Critique of rehabilitative techniques in the treatment of cerebral palsy, *Arch. Phys. Med. Rehab., 43*:238–245, 1962. The rehabilitative techniques used in treatment of patients with cerebral palsy are reviewed from the standpoint of neurophysiologic theory. Two basic concepts—that changes in the nature of movement demonstrate phylogenetic and ontogenetic components and the dependence of movement on sensori-motor integration—are applied to current theories of therapy. The subject is controversial, with scanty experimental evidence and impressionistic evaluations, yet favorable results seem to occur on occasion. All methods of treatment may have value at one time or another. None can service all patients. More attention should be paid to sensory and motor interdependence rather than to the motor disability alone.

Tenney, J. W., and Lennox, M. A.: Children with epilepsy, *Nat. Educ. Ass. J., 40*:327–328, 1951. (Reprinted in *The Exceptional Child,* eds. J. F. Magary and J. R. Eichorn. Holt, Rinehart & Winston, 1961.) Various types of seizures, the electroencephalogram, and various medications are described. Some facts about epilepsy are stated: (1) it occurs in one of every 100 children, (2) seizures can be completely controlled in more than half of the cases and reduced in an additional 30 percent, (3) intelligence is normal, and (4) epileptic children should attend regular school. A variety of school plans in effect in some cities (New York, Detroit, Baltimore, etc.) in this country are described.

Tizard, B.: The personality of epileptics, *Psychol. Bull., 59*:196–211, 1962. In this review of the literature, five basic theories about the personality of epileptics are outlined, and the extent to which they are

confirmed or rejected by clinical and psychological investigations is considered. Findings of studies that have used the Rorschach have been shown to be contradictory, and the inadequacies of this test are pointed out. Progress depends on the recognition of the complex environmental and pathophysiological factors involved.

Winfield, D. L.: Emotional disturbances of the brain damaged child with reference to the electroencephalogram, *Memphis Mid-South Med. J., 36*:403–406, 1961. After presenting a brief description of how the EEG works, the author points out that it is sensitive to disturbed brain neurophysiology but not to dead tissue. He discusses some of the factors correlated with disturbed EEG's, including age, source of referrals, completeness of studies, competence of the electroencephalographer, nature of the brain-wave activity, and conditions of examination. More extensive use of the EEG, even in cases without significant history of damage, is urged. Particular characteristics of temporal lobe seizures are outlined. A majority of patients referred for acting-out behavior, convulsions, or headaches show the "6 and 14 per second positive spike pattern" described by Gibbs. The finding is important from a medico-legal standpoint and requires a persistent regime of medication. "An EEG is never contraindicated."

Wortis, J.: A note on the concept of the "brain-injured child," *Amer. J. Ment. Defic., 64*:204–206, 1956. Strauss and Lehtinen's concept of the brain-injured child is accurate but oversimplified. There is a variety of brain-injured children having a variety of causes and a variety of behavioral consequences. Experience in a retardation clinic demonstrates this. Behavior is a function of anatomy and configuration of the brain, personality, the momentary situation, and "the condition of the organism."

Wepman, J.: *A Selected Bibliography on Brain Impairment, Aphasia and Organic Psychodiagnosis,* Language Research Association, Chicago, 1962. This list of references contains a bibliography of 267 items on language development and language impairment in children plus an extensive bibliography on brain-injured adults.